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SPECIFICATIONS FOR IDAMST SOFTWARE. VOLUME II. APPENDICES.(U)
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AFAL-TR-76-209
Volume II - Appendices

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SPECIFICATIONS FOR IDAMST SOFTWARE

GOVERNMENT AVIONICS DEPARTMENT
DOUGLAS AIRCRAFT COMPANY
3855 LAKEWOOD BOULEVARD
LONG BEACH, CALIFORNIA 90846

JULY 1977



TECHNICAL REPORT AFAL-TR-76-209, Volume II
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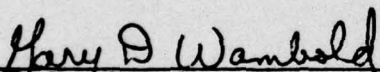
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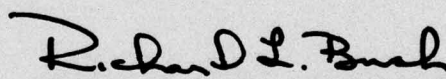
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This final report was submitted by the McDonnell Douglas Corporation, Douglas Aircraft Company, 3855 Lakewood Blvd., Long Beach, California 90846, under contract F33615-76-C-1297, job order 2003 01 09, with the Air Force Avionics Laboratory, System Avionics Division. Mr. Gary D. Wambold/AFAL/AAA-1 was the project engineer. This report has been reviewed and cleared for open publication and/or public release by the Aeronautical Systems Division Office of Information (ASD/OIP) in accordance with AFR 190-17 and DODD 5230.9. There is no objection to unlimited distribution of this to the National Technical Information Service (NTIS). Publication of this report does not constitute Air Force approval of the reports findings or conclusions. It is published only for the exchange and stimulation of ideas. This technical report has been reviewed and is approved for publication.


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PREFACE
TO AFAL-TR-76-209,
MDC REPORT J7271
VOLUME II - APPENDICES

This volume contains the Appendices to the report, separated from the main text to reduce individual book size.

Each appendix includes introductory material to provide a "stand alone" capability. However, Volume I should be utilized where a detailed understanding of ancillary data and background is required.

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APPENDIX A

TO

FINAL TECHNICAL REPORT

FOR

AFAL CONTRACT NUMBER F33615-76-C-1297

IDAMST MISSION

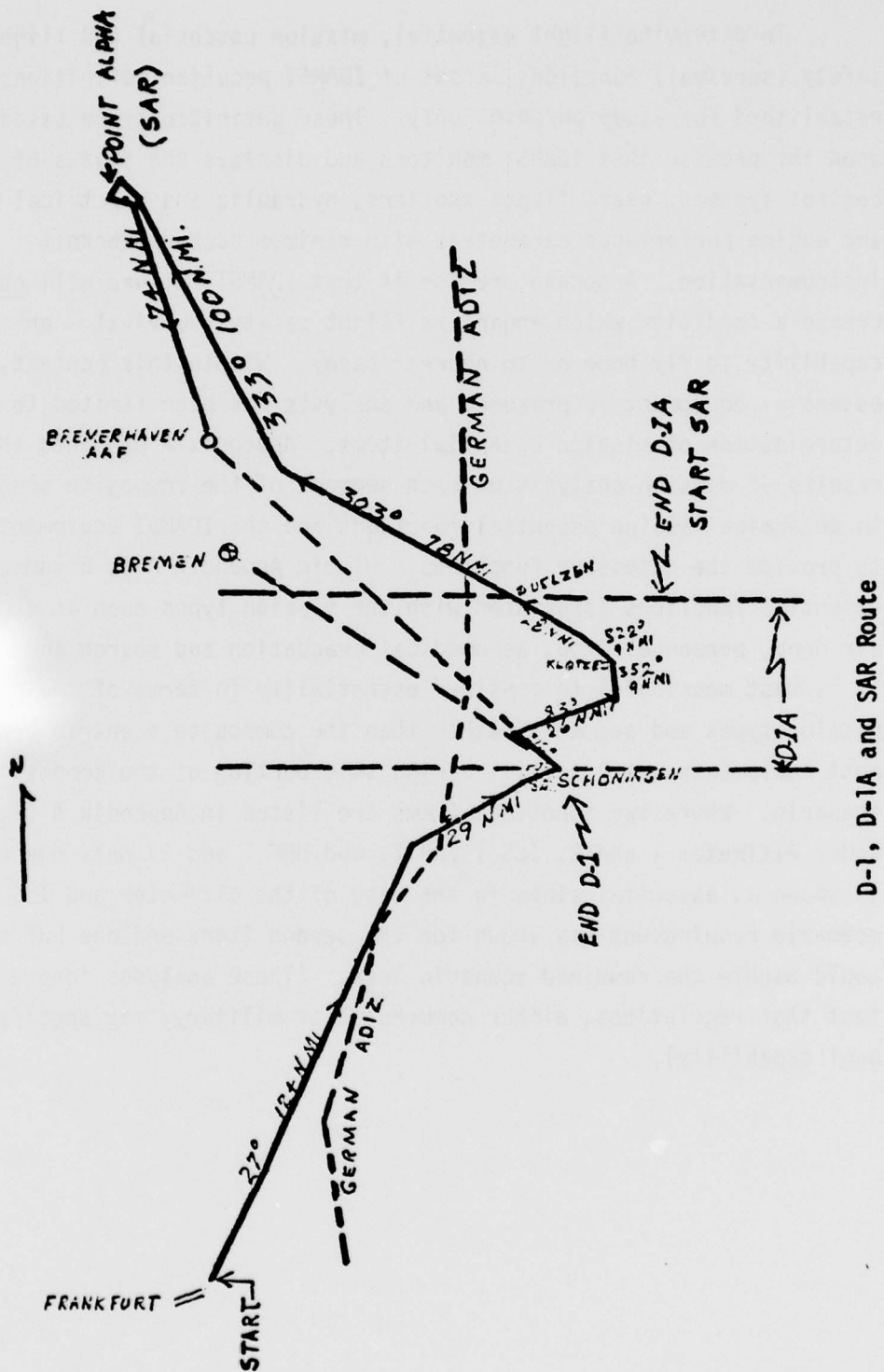
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ESSENTIAL EQUIPMENT ANALYSIS

The procedures for Mission Scenario Analysis employed an approach designed to reduce operations to manageable segments which can be graphically portrayed on normal size paper. This approach also enhances detail analysis of mission operational segments such as a specific Air Drop and the attendant time sequence of events/functions involved for crew, hardware and software. Page 6 shows a map/route representation of the flights involved in the scenario covering D-1, (heavy airdrop originating at Frankfurt and dropping at Schoningen), D-1A (Covert personnel drop at KLOTZE) and continuing to the search and rescue mission north to Bremerhaven. The flight distance, headings, and relative location of vital points such as drop location, airbases and etc. are illustrated. Page 7 portrays the same flights in profile, with time sequence corresponding to changing flight speeds and flight modes. The development of Functional Sequence Analysis Worksheets which show scenario events time sequenced to incremental mission time, flight phase/function, crew functions and subsystems involved provide adequate information for development of top-level Functional Sequence Diagrams. Worksheets have been prepared and were delivered to AFAL as part of the Interim Technical Report.

The IDAMST Avionics Suite lists twenty items of equipment designed to perform specific functions. Some equipment items such as the Radar Set provide multi-functional-capability, i.e., ground mapping, weather mapping, etc. Each individual function is performed with the equipment in a specified operational mode and will require software functionally designed for that mode. The IDAMST Avionics Suite provides functional alternatives for mission performance to ensure world wide operational capability. This capability was analyzed by evaluating the essential functions of communications, navigation, target acquisition, vehicle defense, and mission management and the sub-functions which occur under each.

To determine flight essential, mission essential and flight safety (survival) functions, a set of IDAMST peculiar definitions was established for study purposes only. These definitions are based upon the premise that IDAMST monitors and displays the status of flight control systems, gear, flaps, spoilers, hydraulic and electrical systems, and engine performance parameters with minimum back-up cockpit instrumentation. A second premise is that IDAMST failure will not create a condition which endangers flight safety (survival - or capability to fly home or to nearest base). Within this context, flight essential equipment is presumed and analysis has been limited to determination of mission essential items. Appendix A presents the results of mission analysis of each segment of the composite scenario to determine mission essential functions and the IDAMST equipment required to provide the necessary functions. Within Appendix A is a summary of essential functions associated with the mission types such as deployment, air drop, personnel drop, aeromedical evacuation and search and rescue. It is most meaningful to consider essentiality in terms of the discrete mission types and segments rather than the composite scenario because most equipments are essential during some portion of the composite scenario. Where two identical items are listed in Appendix A (i.e., Radar Altimeter 1 and 2, ILS 1 and 2, and UHF 1 and 2) only one each is shown as essential since in the case of the altimeter and ILS no scenario requirement was shown for the second items and one UHF set could handle the combined scenario load. (These analyses ignore the fact that regulations, either commercial or military; may specify some dual capability).



D-1, D-1A and SAR Route

IDAMST SCENARIO MISSIONS

<u>NO.</u>	<u>MISSION</u>	<u>MODES</u>
1.	DEPLOYMENT	<p>(1) T. O. and Climb, (2) Fly Formation,</p> <p>(3) Cruise (over water), (4) Refuel,</p> <p>(5) Repeat #3, (6) Descend, (7) Approach and Land (ILS).</p>



MISSION FUNCTION: DEPLOYMENT

MODES: T.O., Climb, Fly Formation, Cruise, Refuel, Cruise, Descend, Approach & Land

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
--------------------------	----------------------------------	------------------	-------------------

COMMUNICATION

PA			
HF/SSB	Long range comm-flt control, pos. rep.		X
VHF/AM	Comm-tower, dep. control, report points		X
VHF/FM			
IC			
SV			
IFF	Flight and position identification		X
UHF-1	Formation Control-comm. with tankers		
UHF-2			

NAVIGATION

RS	Update INS (over Europe)		X
RA-1			
RA-2			
INS	Precise navigation control		X
OMEGA	Update INS (over water)		X
UHF/ADF	Locate approach control points		X
LF/ADF			
TACAN			

TARGET ACQUISITION

RS	SKE-Back-up in formation flight		X
RA-1			
INS			
OMEGA			
TACAN			
SKE			
RB	Position relative to tankers		X

VEHICLE DEFENSE

IC			
SV			
IFF			
ESM			
ID			

MISSION MANAGEMENT

RS	Position relative to tankers (refuel)		X
SKE	Assist assemble in flight formation		X
ILS-1	Landing system for IFR landing		X
ILS-2			
TACAN			

IDAMST AVIONICS SUITE

<u>S. NO.</u>	<u>SUBSYSTEM</u>	<u>HARDWARE FUNCTION</u>
1.	Radar Set	Multi-mode to include terrain mapping.
2.	Radar Altimeter	Indicate precise altitude, (below 5,000 ft.)
3.	INS	Indicate precise position, (latitude/longitude)
4.	Omega	Long range navigation aid
5.	Public Address System	Loud Speaker
6.	HF/SSB Radio	Long range communication (beyond L.O.S.)
7.	VHF/AM Radio	Traffic control (military and commercial)
8.	VHF/FM Radio	Tactical Command System (air to ground)
9.	Intercom	Communication within aircraft
10.	Secure Voice	Coded/Scrambled
11.	IFF	Identify and locate friendly aircraft

IDAMST AVIONICS SUITE Continued

<u>S. NO.</u>	<u>SUBSYSTEM</u>	<u>HARDWARE FUNCTION</u>
12.	UHF Radio	L.O.S. communication system (relatively interference free)
13.	UHF/ADF	Directional indicator-to/from broadcast station
14.	VOR/ILS	Landing aid system in aircraft using ILS aids-ground or portable
15.	LF/ADF	Directional broadcast receiver
16.	SKE	Formation position indicator
17.	Radar Beaxon	Transponder-activated by radar QDERY
18.	TACAN	In-theater tactical navigation aid
19.	Infrared Detection	Detects rocket/and other IR firings
20.	ESM/Passive Radar	Indicate painting by radar

MISSION FUNCTION: DEPLOYMENT

MODE: Take Off/Climb

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
--------------------------	----------------------------------	------------------	-------------------

COMMUNICATION

PA			
HF/SSB			
VHF/AM	Comm-tower, Dep. Control, Rep. Points	X	X
VHF/FM			
IC		X	
SV			
IFF			
UHF-1			
UHF-2			

NAVIGATION

RS	Back-up SKE in assemble formation	X	
RA-1			
RA-2			
INS			
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			

TARGET ACQUISITION

RS
RA-1
RA-2
INS
OMEGA
TACAN
SKE
RB

VEHICLE DEFENSE

IC
SV
IFF
ESM
ID

MISSION MANAGEMENT

RS			
SKE	Assemble flight formation	X	
ILS-1			
ILS-2			
TACAN			

MISSION FUNCTION: DEPLOYMENT

MODE: Cruise (Over Water)

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
--------------------------	----------------------------------	------------------	-------------------

COMMUNICATION

PA			
HF/SSB	Flight Control/Pos. Rept-Long Range	X	X
VHF/AM	Position Report/Flight Control	X	X
VHF/FM			
IC		X	
SV			
IFF	AC/Flight-Identification	X	X
UHF-1	Formation Control & Communication	X	X
UHF-2			

NAVIGATION

RS			
RA-1			
RA-2			
INS	Precise Navigation Control	X	X
OMEGA	Update INS	X	X
UHF/ADF			
LF/ADF			
TACAN			

TARGET ACQUISITION

RS			
RA-1			
RA-2			
INS			
OMEGA			
TACAN			
SKE			
RB			

VEHICLE DEFENSE

IC			
SV			
IFF			
ESM			
ID			

MISSION MANAGEMENT

RS			
SKE		X	
ILS-1			
ILS-2			
TACAN			

MISSION FUNCTION: DEPLOYMENT

MODE: Refuel

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
--------------------------	----------------------------------	------------------	-------------------

COMMUNICATION

PA HF/SSB VHF/AM VHF/FM IC SV IFF	Traffic Control - Beyond L.O.S.	X	X
UHF-1 UHF-2	Formation Comm. & Control Tanker Fleet Comm.	X	X

NAVIGATION

RS RA-1 RA-2 INS OMEGA UHF/ADF LF/ADF TACAN	Precise Navigation/Position Update INS	X X	
--	---	--------	--

TARGET ACQUISITION

RS RA-1 RA-2 INS OMEGA TACAN SKE RB	Precise Position Update INS Position Relative to Tankers	X X X	 X
--	--	-----------------	-------------------

VEHICLE DEFENSE

IC
SV
IFF
ESM
ID

MISSION MANAGEMENT

RS SKE ILS-1 ILS-2 TACAN	Position Relative to Tankers	X	X
--------------------------------------	------------------------------	---	---

MISSION FUNCTION: DEPLOYMENT

MODE: Descend

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
--------------------------	----------------------------------	------------------	-------------------

COMMUNICATION

PA	Enroute Reporting	X	
HF/SSB			
VHF/AM			
VHF/FM			
IC			
SV			
IFF			
UHF-1			
UHF-2			

NAVIGATION

RS	Update INS	X	X
RA-1			
RA-2			
INS	Precise Navigation	X	X
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			

TARGET ACQUISITION

RS
RA-1
RA-2
INS
OMEGA
TACAN
SKE
RB

VEHICLE DEFENSE

IC
SV
IFF
ESM
ID

MISSION MANAGEMENT

RS
SKE
ILS-1
ILS-2
TACAN

MISSION FUNCTION: DEPLOYMENT

MODE: Approach and Landing

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
--------------------------	----------------------------------	------------------	-------------------

COMMUNICATION

PA			
HF/SSB			
VHF/AM	Traffic Control, Military & Commercial	X	X
VHF/FM			
IC			
SV			
IFF			
UHF-1			
UHF-2			

NAVIGATION

RS			
RA-1	Altitude Above Terrain	X	
RA-2			
INS			
OMEGA			
UHF/ADF	Determine Location of Reporting Point	X	X
LF/ADF			
TACAN			

TARGET ACQUISITION

RS			
RA-1			
RA-2			
INS			
OMEGA			
TACAN			
SKE			
RB			

VEHICLE DEFENSE

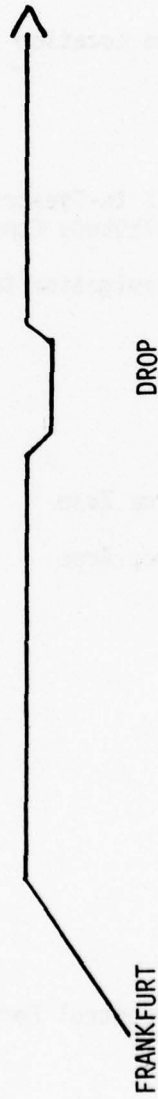
IC			
SV			
IFF			
ESM			
ID			

MISSION MANAGEMENT

RS			
SKE			
ILS-1	Instrument Landing System for IFR Conditions - Fixed or Portable	X	X
TACAN			

IDAMST SCENARIO MISSIONS

<u>NO.</u>	<u>MISSION</u>	<u>MODES</u>
2.	AIR DROP (HIGH ALTITUDE)	(1) T. O. and Climb, (2) Fly Formation, (3) Short Range Cruise, (4) Descend, (5) Formation Drop, (6) Repeat #3.



MISSION FUNCTION: HIGH ALTITUDE AIR DROP

MODES: T.O. and Climb, Fly Formation, Cruise, Descend, Formation Drop, Cruise

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
--------------------------	----------------------------------	------------------	-------------------

COMMUNICATION

PA			
HF/SSB	Long Range Communication with ALCE		X
VHF/AM	Comm-Tower, Dep. Control, Reporting		X
VHF/FM	Communicate with Drop Zone		X
IC			
SV			
IFF	Ident. and Location		X
UHF-1			
UHF-2			

NAVIGATION

RS	Update INS In-Theater		X
RA-1	Precise Altitude Control		X
RA-2			
INS	Precise Navigation Control		X
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			

TARGET ACQUISITION

RS	Locate Drop Zone		X
RA-1			
INS	Locate Drop Area		X
OMEGA			
TACAN			
SKE			
RB			

VEHICLE DEFENSE

IC			
SV			
IFF			
ESM			
ID			

MISSION MANAGEMENT

RS			
SKE	Assemble/Control Formation		X
ILS-1			
ILS-2			
TACAN			

MISSION FUNCTION: AIR DROP HIGH ALT. MODE: Take Off/Climb

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
--------------------------	----------------------------------	------------------	-------------------

COMMUNICATION

PA			
HF/SSB			
VHF/AM	Comm-Tower, Dep. Control, Rep Points	X	X
VHF/FM			
IC			
SV			
IFF			
UHF-1			
UHF-2			

NAVIGATION

RS	Back-Up SKE in Assemble Formation	X	
RA-1			
RA-2			
INS			
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			

TARGET ACQUISITION

RS
RA-1
RA-2
INS
OMEGA
TACAN
SKE
RB

VEHICLE DEFENSE

IC
SV
IFF
ESM
ID

MISSION MANAGEMENT

RS			
SKE	Assemble Flight Formation	X	
ILS-1			
ILS-2			
TACAN			

MISSION FUNCTION: HIGH ALTITUDE AIR DROP MODE: Fly Formation

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
--------------------------	----------------------------------	------------------	-------------------

COMMUNICATION

PA			
HF/SSB	Beyond Line-Of-Sight Comm.	X	X
VHF/AM			
VHF/FM			
IC			
SV			
IFF	Ident. & Location		
UHF-1			
UHF-2			

NAVIGATION

RS	Update INS In-Theater	X	X
RA-1	Precise Alt. Control Below 5,000 Ft.	X	
RA-2			
INS	Precise Navigation	X	
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			

TARGET ACQUISITION

RS
RA-1
RA-2
INS
OMEGA
TACAN
SKE
RB

VEHICLE DEFENSE

IC
SV
IFF
ESM
ID

MISSION MANAGEMENT

RS			
SKE	Maintain Formation Position	X	X
ILS-1			
ILS-2			
TACAN			

MISSION FUNCTION: HIGH ALTITUDE AIR DROP MODE: Cruise (Short Range)

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSOS)	FLIGHT ESSENT	MISSION ESSENT
--------------------------	----------------------------------	------------------	-------------------

COMMUNICATION

PA			
HF/SSB			
VHF/AM			
VHF/FM	Enroute Reporting	X	
IC			
SV			
IFF			
UHF-1			
UHF-2			

NAVIGATION

RS	Ground Mapping Update of INS	X	X
RA-1			
RA-2			
INS	Precise Navigation	X	X
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			

TARGET ACQUISITION

RS			
RA-1			
RA-2			
INS			
OMEGA			
TACAN			
SKE			
RB			

VEHICLE DEFENSE

IC			
SV			
IFF			
ESM			
ID			

MISSION MANAGEMENT

RS			
SKE			
ILS-1			
ILS-2			
TACAN			

MISSION FUNCTION: HIGH ALTITUDE AIR DROP MODE: Descend

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
--------------------------	----------------------------------	------------------	-------------------

COMMUNICATION

PA			
HF/SSB			
VHF/AM	Enroute Reporting	X	
VHF/FM			
IC			
SV			
IFF			
UHF-1			
UHF-2			

NAVIGATION

RS	Update INS	X	X
RA-1			
RA-2			
INS	Precise Navigation	X	X
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			

TARGET ACQUISITION

RS
RA-1
RA-2
INS
OMEGA
TACAN
SKE
RB

VEHICLE DEFENSE

IC
SV
IFF
ESM
ID

MISSION MANAGEMENT

RS
SKE
ILS-1
ILS-2
TACAN

MISSION FUNCTION: HIGH ALTITUDE
AIR DROP

MODE: Air Drop (Cargo)

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
--------------------------	----------------------------------	------------------	-------------------

COMMUNICATION

PA			
HF/SSB	Comm. with Airlift Control Element	X	X
VHF/AM			
VHF/FM	Comm. with Drop Zone Command	X	X
IC			
SV			
IFF			
UHF-1			
UHF-2			

NAVIGATION

RS	Update INS	X	X
RA-1	Precise Altitude to Limit Drop Dispersion	X	
RA-2			
INS	Navigation to Drop Area	X	X
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			

TARGET ACQUISITION

RS	Locate Drop Zone	X	X
RA-1			
RA-2			
INS	Locate Drop Area	X	X
OMEGA			
TACAN			
SKE			
RB			

VEHICLE DEFENSE

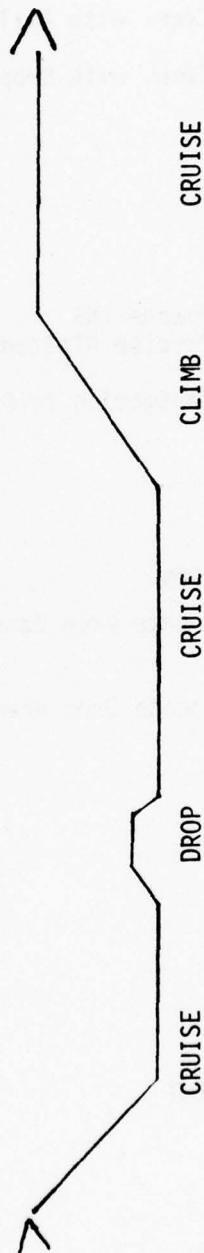
IC			
SV			
IFF			
ESM			
ID			

MISSION MANAGEMENT

RS			
SKE			
ILS-1			
ILS-2			
TACAN			

IDAMST SCENARIO MISSIONS

<u>NO.</u>	<u>MISSION</u>	<u>MODES</u>
3.	PERSONNEL DROP (COVERT)	DIA
		(1) Descend, (2) Short Range Cruise, (3) Radar Painted, (4) Personnel Drop, (5) Repeat #2.



MISSION FUNCTION: PERSONNEL DROP

MODES: Descend, Cruise, Drop, Cruise (Low Altitude), Cruise

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSIDS)	FLIGHT ESSENT	MISSION ESSENT
--------------------------	-----------------------------------	------------------	-------------------

COMMUNICATION

PA			
HF/SSB	Comm. to ALCE		X
VHF/AM			
VHF/FM			
IC			
SV	Comm. to ECM Support Aircraft		X
IFF			
UHF-1			
UHF-2			

NAVIGATION

RS	Update INS/Ground Mapping		X
RA-1	Precise Altitude Control		X
RA-2			
INS	Precise Navigation		X
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			

TARGET ACQUISITION

RS			
RA-1			
INS			
OMEGA			
TACAN			
SKE			
RB			

VEHICLE DEFENSE

IC			
SV	Comm. to ECM Support Aircraft		X
IFF	Ident/Position		X
ESM	Determine Radar Painting		X
ID	Detect Missile Launch		X

MISSION MANAGEMENT

RS			
SKE			
ILS-1			
ILS-2			
TACAN			

MISSION FUNCTION: PERSONNEL DROP

MODE: Descend

EQUIPMENT REQUIRED FUNCTION
(MAJ FUNCT) (FROM FSDS)

FLIGHT MISSION
ESSENT ESSENT

COMMUNICATION

PA
HF/SSB
VHF/AM
VHF/FM
IC
SV
IFF
UHF-1
UHF-2

NAVIGATION

RS	Update INS	X	X
RA-1	Precise Altitude Control		
RA-2			
INS	Precise Navigation	X	X
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			

TARGET ACQUISITION

RS
RA-1
RA-2
INS
OMEGA
TACAN
SKE
RB

VEHICLE DEFENSE

IC
SV
IFF
ESM
ID

MISSION MANAGEMENT

RS
SKE
ILS-1
ILS-2
TACAN

MISSION FUNCTION: PERSONNEL DROP

MODE: Cruise (Short Range)

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSIDS)	FLIGHT ESSENT	MISSION ESSENT
--------------------------	-----------------------------------	------------------	-------------------

COMMUNICATION

PA
HF/SSB
VHF/AM
VHF/FM
IC
SV
IFF
UHF-1
UHF-2

NAVIGATION

RS	Ground Mapping Update of INS	X	X
RA-1	Precise Altitude Control	X	X
RA-2			
INS	Precise Navigation	X	X
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			

TARGET ACQUISITION

RS
RA-1
RA-2
INS
OMEGA
TACAN
SKE
RB

VEHICLE DEFENSE

IC
SV
IFF
ESM
ID

MISSION MANAGEMENT

RS
SKE
ILS-1
ILS-2
TACAN

MISSION FUNCTION: PERSONNEL DROP

MODE: Condition - Radar Painted

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
--------------------------	----------------------------------	------------------	-------------------

COMMUNICATION

PA
HF/SSB
VHF/AM
VHF/FM
IC
SV
IFF
UHF-1
UHF-2

Comm. to ECM Support Aircraft

X X

NAVIGATION

RS
RA-1
RA-2
INS
OMEGA
UHF/ADF
LF/ADF
TACAN

Update INS for Fix

X

Position Required

X

TARGET ACQUISITION

RS
RA-1
RA-2
INS
OMEGA
TACAN
SKE
RB

VEHICLE DEFENSE

IC
SV
IFF
ESM
ID

Relay Message for ECM Help
Identify as Friend
Determine Radar Freq. AZMUTH, DECL
Detect Missile Launch

X X
X X
X X
X X

MISSION MANAGEMENT

RS
SKE
ILS-1
ILS-2
TACAN

MISSION FUNCTION: PERSONNEL DROP

MODE: Condition - IR Source

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSIDS)	FLIGHT ESSENT	MISSION ESSENT
--------------------------	-----------------------------------	------------------	-------------------

COMMUNICATION

PA	Communicate to ALCE		
HF/SSB			
VHF/AM			
VHF/FM			
IC	Communicate Threat to Proper Command		
SV		X	X
IFF			
UHF-1			
UHF-2			

NAVIGATION

RS	Update INS for Fix	X	
RA-1			
RA-2	Aircraft Position Required		
INS		X	
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			

TARGET ACQUISITION

RS
RA-1
RA-2
INS
OMEGA
TACAN
SKE
RB

VEHICLE DEFENSE

IC	Request for Support		
SV			
IFF			
ESM	Identify as Friend	X	X
ID	Detect & Locate IR Source	X	X

MISSION MANAGEMENT

RS
SKE
ILS-1
ILS-2
TACAN

MISSION FUNCTION: PERSONNEL DROP

MODE: Air Drop - Personnel

EQUIPMENT REQUIRED FUNCTION
(MAJ FUNCT) (FROM FSIDS)

FLIGHT MISSION
ESSENT ESSENT

COMMUNICATION

PA
HF/SSB
VHF/AM
VHF/FM
IC
SV
IFF
UHF-1
UHF-2

NAVIGATION

RS
RA-1
RA-2
INS
OMEGA
UHF/ADF
LF/ADF
TACAN

TARGET ACQUISITION

RS	Locate Drop Zone	X
RA-1	Precise Altitude Control	X
RA-2		
INS	Locate Drop Area	X
OMEGA		
TACAN		
SKE		
RB		

VEHICLE DEFENSE

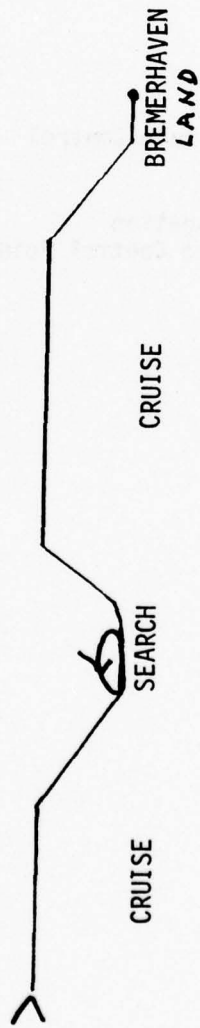
IC
SV
IFF
ESM
ID

MISSION MANAGEMENT

RS
SKE
ILS-1
ILS-2
TACAN

IDAMST SCENARIO MISSIONS

<u>NO.</u>	<u>MISSION</u>	<u>MODES</u>
4.	SEARCH AND RESCUE DIA	(1) Cruise, (2) Search, (3) Descend, (4) Repeat #1, (5) Approach/Land (ILS)



MISSION FUNCTION: SEARCH AND RESCUE

MODES: Cruise, Descend, Search, Cruise, Approach/Land (ILS)

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
--------------------------	----------------------------------	------------------	-------------------

COMMUNICATION

PA			
HF/SSB	Communicate with ALCE		X
VHF/AM	Enroute Reporting		X
VHF/FM	Receive ELF Signal		X
IC			
SV			
IFF			
UHF-1	Communicate with Airborne C.P.		X
UHF-2			

NAVIGATION

RS	Update INS		X
RA-1	Precise Altitude Control		X
RA-2			
INS			
OMEGA	Precise Navigation		X
UHF/ADF	Navigation to Control Point		X
LF/ADF			
TACAN			

TARGET ACQUISITION

RS
RA-1
INS
OMEGA
TACAN
SKE
RB

VEHICLE DEFENSE

IC
SV
IFF
ESM
ID

MISSION MANAGEMENT

RS
SKE
ILS-1
ILS-2
TACAN

MISSION FUNCTION: SEARCH AND RESCUE MODE: Cruise (Short Range)

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSOS)	FLIGHT ESSENT	MISSION ESSENT
--------------------------	----------------------------------	------------------	-------------------

COMMUNICATION

PA			
HF/SSB	Communicate with ALCE		X
VHF/AM	Enroute Reporting		X
VHF/FM			
IC			
SV			
IFF			
UHF-1			
UHF-2			

NAVIGATION

RS	Update of INS	X	X
RA-1			
RA-2			
INS	Precise Navigation	X	X
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			

TARGET ACQUISITION

RS
RA-1
RA-2
INS
OMEGA
TACAN
SKE
RB

VEHICLE DEFENSE

IC
SV
IFF
ESM
ID

MISSION MANAGEMENT

RS
SKE
ILS-1
ILS-2
TACAN

MISSION FUNCTION: SEARCH AND RESCUE MODE: Condition - Search

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSIDS)	FLIGHT ESSENT	MISSION ESSENT
--------------------------	-----------------------------------	------------------	-------------------

COMMUNICATION

PA			
HF/SSB	Receive Search Order (ALCE)	X	X
VHF/AM			
VHF/FM	Receive ELF Signal	X	X
IC			
SV			
IFF			
UHF-1	Communicate with Airborne Command Post	X	
UHF-2			

NAVIGATION

RS	Update INS	X	
RA-1	Low Altitude Profile - Precision Alt.	X	
RA-2			
INS	Navigate to Estimated Location	X	X
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			

TARGET ACQUISITION

RS			
RA-1			
RA-2			
INS			
OMEGA			
TACAN			
SKE			
RB			
VHF/FM	Locate Downed Pilot Position	X	X

VEHICLE DEFENSE

IC			
SV			
IFF			
ESM			
ID			

MISSION MANAGEMENT

RS			
SKE			
ILS-1			
ILS-2			
TACAN			

MISSION FUNCTION: SEARCH AND RESCUE

MODE: Descend

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSOS)
--------------------------	----------------------------------

FLIGHT ESSENT	MISSION ESSENT
------------------	-------------------

COMMUNICATION

PA		
HF/SSB		
VHF/AM	Enroute Reporting	X
VHF/FM		
IC		
SV		
IFF		
UHF-1		
UHF-2		

NAVIGATION

RS	Update INS	X
RA-1	Precise Altitude Control	X
RA-2		
INS	Precise Navigation	X
OMEGA		
UHF/ADF		
LF/ADF		
TACAN		

TARGET ACQUISITION

RS		
RA-1		
RA-2		
INS		
OMEGA		
TACAN		
SKE		
RB		

VEHICLE DEFENSE

IC		
SV		
IFF		
ESM		
ID		

MISSION MANAGEMENT

RS		
SKE		
ILS-1		
ILS-2		
TACAN		

MISSION FUNCTION: SEARCH AND RESCUE MODE: Cruise

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSIDS)	FLIGHT ESSENT	MISSION ESSENT
--------------------------	-----------------------------------	------------------	-------------------

COMMUNICATION

PA			
HF/SSB			
VHF/AM	Enroute Reporting	X	
VHF/FM			
IC			
SV			
IFF			
UHF-1			
UHF-2			

NAVIGATION

RS	Ground Mapping Update of INS	X	X
RA-1			
RA-2			
INS	Precise Navigation	X	X
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			

TARGET ACQUISITION

RS
RA-1
RA-2
INS
OMEGA
TACAN
SKE
RB

VEHICLE DEFENSE

IC
SV
IFF
ESM
ID

MISSION MANAGEMENT

RS
SKE
ILS-1
ILS-2
TACAN

MISSION FUNCTION: SEARCH AND RESCUE MODE: Approach and Landing

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
--------------------------	----------------------------------	------------------	-------------------

COMMUNICATION

PA			
HF/SSB			
VHF/AM	Traffic Control, Military & Commercial	X	X
VHF/FM			
IC			
SV			
IFF			
UHF-1			
UHF-2			

NAVIGATION

RS			
RA-1	Altitude Above Terrain	X	
RA-2			
INS			
OMEGA			
UHF/ADF	Determine Location of Reporting Point	X	X
LF/ADF			
TACAN			

TARGET ACQUISITION

RS			
RA-1			
RA-2			
INS			
OMEGA			
TACAN			
SKE			
RB			

VEHICLE DEFENSE

IC			
SV			
IFF			
ESM			
ID			

MISSION MANAGEMENT

RS			
SKE			
ILS-1	Instrument Landing System for IFR Conditions	X	X
	Fixed or Portable		
TACAN			

IDAMST SCENARIO MISSIONS

<u>NO.</u>	<u>MISSION</u>	<u>MODES</u>
5.	LOW ALTITUDE PARACHUTE DROP, D2	(1) T.O./Climb, (2) Cruise, (3) Descent, (4) Go Around, (5) Repeat #3, (6) Repeat #2.



MISSION FUNCTION: LOW ALTITUDE PARACHUTE DROP

MODES: T.O. & Climb, Cruise, Descend, Cruise (Go-Around), Cruise

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
--------------------------	----------------------------------	------------------	-------------------

COMMUNICATION

PA			
HF/SSB	Comm-ALCE for Instructions		X
VHF/AM	Comm-Tower, Dep. Control, Rep. Points		X
VHF/FM	Comm. with Drop Zone		X
IC			
SV			
IFF			
UHF-1	Communicate-Direct Flight		
UHF-2			

NAVIGATION

RS	Ground Mapping/Update INS		X
RA-1			
RA-2			
INS	Precise Navigation		X
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			

TARGET ACQUISITION

RS	Identify Drop Zone		X
RA-1	Precise Altitude Control		X
INS	Locate Drop Area		X
OMEGA			
TACAN			
SKE			
RB			

VEHICLE DEFENSE

IC			
SV			
IFF			
ESM			
ID			

MISSION MANAGEMENT

RS			
SKE			
ILS-1			
ILS-2			
TACAN			

MISSION FUNCTION: LOW ALTITUDE
PARACHUTE DROP

MODE: Take Off/Climb

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
--------------------------	----------------------------------	------------------	-------------------

COMMUNICATION

PA			
HF/SSB			
VHF/AM	Comm - Tower, Dep. Control, Rep. Points	X	X
VHF/FM			
IC			
SV			
IFF			
UHF-1			
UHF-2			

NAVIGATION

RS
RA-1
RA-2
INS
OMEGA
UHF/ADF
LF/ADF
TACAN

TARGET ACQUISITION

RS
RA-1
RA-2
INS
OMEGA
TACAN
SKE
RB

VEHICLE DEFENSE

IC
SV
IFF
ESM
ID

MISSION MANAGEMENT

RS
SKE
ILS-1
ILS-2
TACAN

MISSION FUNCTION: LOW ALTITUDE DROP MODE: Cruise

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSOS)	FLIGHT ESSENT	MISSION ESSENT
--------------------------	----------------------------------	------------------	-------------------

COMMUNICATION

PA	Enroute Reporting		
HF/SSB			
VHF/AM		X	
VHF/FM			
IC			
SV			
IFF			
UHF-1			
UHF-2			

NAVIGATION

RS	Ground Mapping Update of INS	X	X
RA-1			
RA-2	Precise Navigation		
INS		X	X
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			

TARGET ACQUISITION

RS
RA-1
RA-2
INS
OMEGA
TACAN
SKE
RB

VEHICLE DEFENSE

IC
SV
IFF
ESM
ID

MISSION MANAGEMENT

RS
SKE
ILS-1
ILS-2
TACAN

MISSION FUNCTION: LOW ALTITUDE DROP

MODE: Descend

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
--------------------------	----------------------------------	------------------	-------------------

COMMUNICATION

PA			
HF/SSB			
VHF/AM	Enroute Reporting	X	
VHF/FM			
IC			
SV			
IFF			
UHF-1			
UHF-2			

NAVIGATION

RS	Update INS	X	X
RA-1			
RA-2			
INS	Precise Navigation	X	X
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			

TARGET ACQUISITION

RS
RA-1
RA-2
INS
OMEGA
TACAN
SKE
RB

VEHICLE DEFENSE

IC
SV
IFF
ESM
ID

MISSION MANAGEMENT

RS
SKE
ILS-1
ILS-2
TACAN

MISSION FUNCTION: LOW ALTITUDE DROP MODE: Cruise (Go-Around)

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSIDS)	FLIGHT ESSENT	MISSION ESSENT
--------------------------	-----------------------------------	------------------	-------------------

COMMUNICATION

PA			
HF/SSB	Call ALCE for Instructions		X
VHF/AM			
VHF/FM			
IC			
SV			
IFF			
UHF-1	Communicate Advise Flight		X
UHF-2			

NAVIGATION

RS			
RA-1			
RA-2			
INS	Precise Navigation		X
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			

TARGET ACQUISITION

RS	Identify Drop Zone		X
RA-1	Precise Altitude Control		X
RA-2			
INS			
OMEGA			
TACAN			
SKE			
RB			

VEHICLE DEFENSE

IC			
SV			
IFF			
ESM			
ID			

MISSION MANAGEMENT

RS			
SKE			
ILS-1			
ILS-2			
TACAN			

MISSION FUNCTION: LOW ALTITUDE DROP MODE: Air Drop

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
--------------------------	----------------------------------	------------------	-------------------

COMMUNICATION

PA			
HF/SSB	Communicate with Airlift Control Element	X	X
VHF/AM			
VHF/FM	Communicate with Drop Zone Command	X	X
IC			
SV			
IFF			
UHF-1			
UHF-2			

NAVIGATION

RS	Update INS	X	X
RA-1	Precise Altitude Required	X	X
RA-2			
INS	Navigation to Drop Area	X	X
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			

TARGET ACQUISITION

RS	Locate Drop Zone	X	X
RA-1			
RA-2			
INS	Locate Drop Area	X	X
OMEGA			
TACAN			
SKE			
RB			

VEHICLE DEFENSE

IC			
SV			
IFF			
ESM			
ID			

MISSION MANAGEMENT

RS			
SKE			
ILS-1			
ILS-2			
TACAN			

MISSION FUNCTION: LOW ALTITUDE DROP

MODE: Cruise

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
--------------------------	----------------------------------	------------------	-------------------

COMMUNICATION

PA			
HF/SSB			
VHF/AM	Enroute Reporting	X	
VHF/FM			
IC			
SV			
IFF			
UHF-1			
UHF-2			

NAVIGATION

RS			
RA-1			
RA-2			
INS	Precise Navigation	X	X
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			

TARGET ACQUISITION

RS			
RA-1			
RA-2			
INS			
OMEGA			
TACAN			
SKE			
RB			

VEHICLE DEFENSE

IC			
SV			
IFF			
ESM			
ID			

MISSION MANAGEMENT

RS			
SKE			
ILS-1			
ILS-2			
TACAN			

IDAMST SCENARIO MISSIONS

<u>No.</u>	<u>MISSION</u>	<u>MODES</u>
6.	RESUPPLY - AIRLAND. D3 AEROMEDICAL EVACUATION	(1) Cruise, (2) Descend, (3) ARA Landing, (4) T. O. & Climb, (5) Engine Out Operation, (6) Repeat #1, (7) Approach/Land



MISSION FUNCTION: BARE BASE LANDING (ARA)

MODES: Cruise, Descend, ARA, T.O./Climb, Engine Out, APP./Land

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSIDS)	FLIGHT ESSENT	MISSION ESSENT
--------------------------	-----------------------------------	------------------	-------------------

COMMUNICATION

PA			
HF/SSB			
VHF/AM	Enroute Reporting		X
'HF/FM	Communicate Military Ground Unit		X
IC			
SV			
IFF			
UHF-1			
UHF-2			

NAVIGATION

RS	Ground Mapping/Update INS		X
RA-1			
RA-2			
INS	Precise Navigation		X
OMEGA			
UHF/ADF	Locate Approach/Fix Point		X
LF/ADF			
TACAN			

TARGET ACQUISITION

RS	Locate/Create Area Display Data		X
RA-1	Precise Altitude Control		X
INS	Navigate to Landing Area		X
OMEGA			
TACAN			
SKE			
RB			

VEHICLE DEFENSE

IC			
SV			
IFF			
ESM			
ID			

MISSION MANAGEMENT

RS	Control Landing Approach Data		X
SKE			
ILS-1	Control Approach Data		X
ILS-2			
TACAN			

MISSION FUNCTION: RESUPPLY - AIRLAND MODE: Cruise

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSIDS)	FLIGHT ESSENT	MISSION ESSENT
--------------------------	-----------------------------------	------------------	-------------------

COMMUNICATION

PA
HF/SSB
VHF/AM
VHF/FM
IC
SV
IFF
UHF-1
UHF-2

Enroute Reporting

X

NAVIGATION

RS
RA-1
RA-2
INS
OMEGA
UHF/ADF
LF/ADF
TACAN

Ground Mapping Update of INS

X

X

Precise Navigation

X

X

TARGET ACQUISITION

RS
RA-1
RA-2
INS
OMEGA
TACAN
SKE
RB

VEHICLE DEFENSE

IC
SV
IFF
ESM
ID

MISSION MANAGEMENT

RS
SKE
ILS-1
ILS-2
TACAN

MISSION FUNCTION: RESUPPLY - AIRLAND MODE: Approach/Landing (ARA)

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
--------------------------	----------------------------------	------------------	-------------------

COMMUNICATION

PA			
HF/SSB			
VHF/AM			
VHF/FM	Communicate w/Military Unit on Ground	X	X
IC			
SV			
IFF			
UHF-1			
UHF-2			

NAVIGATION

RS	Locate & Create Area Display Data	X	X
RA-1	Precise Altitude Indication	X	X
RA-2			
INS	Navigation to Landing Area	X	
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			

TARGET ACQUISITION

RS	Locate/Display Landing Area	X	X
RA-1			
RA-2			
INS	Fly to/Locate Landing Area	X	
OMEGA			
TACAN			
SKE			
RB			

VEHICLE DEFENSE

IC			
SV			
IFF			
ESM			
ID			

MISSION MANAGEMENT

RS	Control Landing Approach	X	X
SKE			
ILS-1			
ILS-2			
TACAN			

MISSION FUNCTION: AEROMEDICAL EVACUATION MODE: Take Off/Climb

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSIDS)	FLIGHT ESSENT	MISSION ESSENT
--------------------------	-----------------------------------	------------------	-------------------

COMMUNICATION

PA
HF/SSB
VHF/AM
VHF/FM
IC
SV
IFF
UHF-1
UHF-2

NAVIGATION

RS
RA-1
RA-2
INS
OMEGA
UHF/ADF
LF/ADF
TACAN
SKE

X X

TARGET ACQUISITION

RS
RA-1
RA-2
INS
OMEGA
TACAN
SKE
RB

VEHICLE DEFENSE

IC
SV
IFF
ESM
ID

MISSION MANAGEMENT

RS
SKE
ILS-1
ILS-2
TACAN

MISSION FUNCTION: AEROMEDICAL EVACUATION

MODE: N/A Special Condition - Engine
Out

EQUIPMENT REQUIRED FUNCTION
(MAJ FUNCT) (FROM FSDS)

FLIGHT MISSION
ESSENT ESSENT

COMMUNICATION

PA
HF/SSB
VHF/AM
VHF/FM
IC
SV
IFF
UHF-1
UHF-2

Obtain Emergency Clearance Procedures

X

X

NAVIGATION

RS
RA-1
RA-2
INS
OMEGA
UHF/ADF
LF/ADF
TACAN

Update INS

X

X

Fly Short Route to Destination

X

X

TARGET ACQUISITION

RS
RA-1
RA-2
INS
OMEGA
TACAN
SKE
RB

VEHICLE DEFENSE

IC
SV
IFF
ESM
ID

MISSION MANAGEMENT

RS
SKE
ILS-1
ILS-2
TACAN

MISSION FUNCTION: AEROMEDICAL EVACUATION MODE: Cruise

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSIDS)	FLIGHT ESSENT	MISSION ESSENT
--------------------------	-----------------------------------	------------------	-------------------

COMMUNICATION

PA			
HF/SSB			
VHF/AM	Enroute Reporting	X	
VHF/FM			
IC			
SV			
IFF			
UHF-1			
UHF-2			

NAVIGATION

RS	Ground Mapping Update of INS	X	X
RA-1			
RA-2			
INS	Precise Navigation	X	X
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			

TARGET ACQUISITION

RS
RA-1
RA-2
INS
OMEGA
TACAN
SKE
RB

VEHICLE DEFENSE

IC
SV
IFF
ESM
ID

MISSION MANAGEMENT

RS
SKE
ILS-1
ILS-2
TACAN

MISSION FUNCTION: AEROMEDICAL EVACUATION

MODE: Descend

EQUIPMENT (MAJ FUNCT) REQUIRED FUNCTION (FROM FSDS)

FLIGHT ESSENT MISSION ESSENT

COMMUNICATION

PA			
HF/SSB			
VHF/AM	Enroute Reporting	X	
VHF/FM			
IC			
SV			
IFF			
UHF-1			
UHF-2			

NAVIGATION

RS	Update INS	X	X
RA-1			
RA-2			
INS	Precise Navigation	X	X
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			

TARGET ACQUISITION

RS			
RA-1			
RA-2			
INS			
OMEGA			
TACAN			
SKE			
RB			

VEHICLE DEFENSE

IC			
SV			
IFF			
ESM			
ID			

MISSION MANAGEMENT

RS			
SKE			
ILS-1			
ILS-2			
TACAN			

MISSION FUNCTION: AEROMEDICAL EVACUATION

MODE: Approach & Landing

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
--------------------------	----------------------------------	------------------	-------------------

COMMUNICATION

PA			
HF/SSB			
VHF/AM	Traffic Control, Military & Commercial	X	X
VHF/FM			
IC			
SV			
IFF			
UHF-1			
UHF-2			

NAVIGATION

RS			
RA-1	Altitude Above Terrain	X	
RA-2			
INS			
OMEGA			
UHF/ADF	Determine Location of Reporting Point	X	X
LF/ADF			
TACAN			

TARGET ACQUISITION

RS			
RA-1			
RA-2			
INS			
OMEGA			
TACAN			
SKE			
RB			

VEHICLE DEFENSE

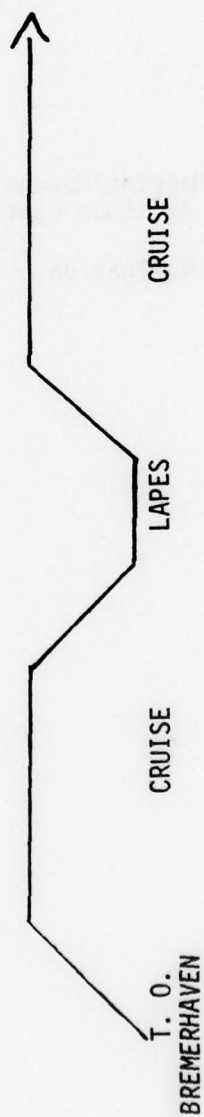
IC			
SV			
IFF			
ESM			
ID			

MISSION MANAGEMENT

RS			
SKE			
ILS-1	Instrument Landing System for IFR Conditions - Fixed or Portable	X	X
TACAN			

IDAMST SCENARIO MISSIONS

<u>NO.</u>	<u>MISSION</u>	<u>MODES</u>
7.	LOW ALTITUDE PARACHUTE EXTRACTION (LAPES) D4	(1) T. O. & Climb, (2) Cruise, (3) Descend, (4) LAPES, (5) Repeat #2



MISSION FUNCTION: LOW ALTITUDE PARACHUTE EXTRACTION (LAPES)

MODES: T.O./Climb, Cruise, Descend, LAPES, Cruise

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSIDS)	FLIGHT ESSENT	MISSION ESSENT
--------------------------	-----------------------------------	------------------	-------------------

COMMUNICATION

PA			
HF/SSB			
VHF/AM	Comm.-Tower, Dep. Control, Rep. Points		X
VHF/FM			
IC			
SV			
IFF			
UHF-1			
UHF-2			

NAVIGATION

RS	Ground Mapping/Update INS		X
RA-1	Precise Altitude Control		X
RA-2			
INS	Precise Navigation		
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			

TARGET ACQUISITION

RS
RA-1
INS
OMEGA
TACAN
SKE
RB

VEHICLE DEFENSE

IC
SV
IFF
ESM
ID

MISSION MANAGEMENT

RS
SKE
ILS-1
ILS-2
TACAN

MISSION FUNCTION: LAPES

MODE: Cruise

EQUIPMENT (MAJ FUNCT) REQUIRED FUNCTION (FROM FSDS)

FLIGHT ESSENT MISSION ESSENT

COMMUNICATION

PA
HF/SSB
VHF/AM Enroute Reporting
VHF/FM
IC
SV
IFF
UHF-1
UHF-2

X

NAVIGATION

RS Ground Mapping Update of INS
RA-1
RA-2
INS Precise Navigation
OMEGA
UHF/ADF
LF/ADF
TACAN

X

X

X

X

TARGET ACQUISITION

RS
RA-1
RA-2
INS
OMEGA
TACAN
SKE
RB

VEHICLE DEFENSE

IC
SV
IFF
ESM
ID

MISSION MANAGEMENT

RS
SKE
ILS-1
ILS-2
TACAN

MISSION FUNCTION: LAPES

MODE: Descend

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
--------------------------	----------------------------------	------------------	-------------------

COMMUNICATION

PA			
HF/SSB			
VHF/AM	Enroute Reporting	X	
VHF/FM			
IC			
SV			
IFF			
UHF-1			
UHF-2			

NAVIGATION

RS	Update INS	X	X
RA-1			
RA-2			
INS	Precise Navigation	X	X
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			

TARGET ACQUISITION

RS
RA-1
RA-2
INS
OMEGA
TACAN
SKE
RB

VEHICLE DEFENSE

IC
SV
IFF
ESM
ID

MISSION MANAGEMENT

RS
SKE
ILS-1
ILS-2
TACAN

MISSION FUNCTION: LAPES

MODE: Air Drop

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
--------------------------	----------------------------------	------------------	-------------------

COMMUNICATION

PA			
HF/SSB	Communication with Airlift Control Element	X	X
VHF/AM			
VHF/FM	Communication with Drop Zone Command	X	X
IC			
SV			
IFF			
UHF-1			
UHF-2			

NAVIGATION

RS	Update INS	X	X
RA-1	Precise Altitude Required	X	
RA-2			
INS	Navigation to Drop Area	X	X
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			

TARGET ACQUISITION

RS	Locate Drop Zone	X	X
RA-1			
RA-2			
INS	Locate Drop Area	X	X
OMEGA			
TACAN			
SKE			
RB			

VEHICLE DEFENSE

IC	Control Drop Approach	X	X
SV			
IFF			
ESM			
ID			

MISSION MANAGEMENT

RS
SKE
ILS-1
ILS-2
TACAN

MISSION FUNCTION: LAPES

MODE: Cruise

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSIDS)	FLIGHT ESSENT	MISSION ESSENT
--------------------------	-----------------------------------	------------------	-------------------

COMMUNICATION

PA
HF/SSB
VHF/AM
VHF/FM
IC
SV
IFF
UHF-1
UHF-2

Enroute Reporting

X

NAVIGATION

RS
RA-1
RA-2
INS
OMEGA
UHF/ADF
LF/ADF
TACAN

Ground Mapping Update of INS

X

X

Precise Navigation

X

X

TARGET ACQUISITION

RS
RA-1
RA-2
INS
OMEGA
TACAN
SKE
RB

VEHICLE DEFENSE

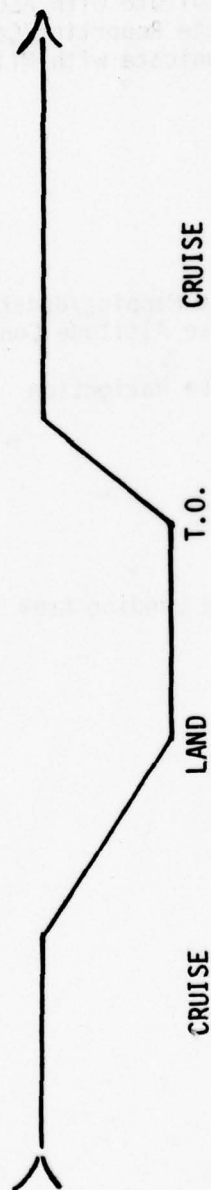
IC
SV
IFF
ESM
ID

MISSION MANAGEMENT

RS
SKE
ILS-1
ILS-2
TACAN

IDAMST SCENARIO MISSIONS

<u>NO.</u>	<u>MISSION</u>	<u>MODES</u>
8.	ROAD LANDING D5	(1) Cruise, (2) Descend, (3) Land, (4) T. O., (5) Repeat #1



MISSION FUNCTION: ROAD LANDING/DELIVERY

MODES: Cruise, Descend, Land (VFR), T.O./Climb, Cruise

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSIDS)	FLIGHT ESSENT	MISSION ESSENT
--------------------------	-----------------------------------	------------------	-------------------

COMMUNICATION

PA			
HF/SSB	Communicate with ALCE		X
VHF/AM	Enroute Reporting/Control		X
VHF/FM	Communicate with Military Ground		X
IC			
SV			
IFF			
UHF-1			
UHF-2			

NAVIGATION

RS	Ground Mapping/Update INS		X
RA-1	Precise Altitude Control		X
RA-2			
INS	Precise Navigation		X
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			

TARGET ACQUISITION

RS	Locate Landing Area		X
RA-1			
INS			
OMEGA			
TACAN			
SKE			
RB			

VEHICLE DEFENSE

IC			
SV			
IFF			
ESM			
ID			

MISSION MANAGEMENT

RS			
SKE			
ILS-1			
ILS-2			
TACAN			

MISSION FUNCTION: RESUPPLY - ROAD LAND

MODE: Cruise

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
--------------------------	----------------------------------	------------------	-------------------

COMMUNICATION

PA	Communicate with ALCE Enroute Reporting		X
HF/SSB			
VHF/AM		X	
VHF/FM			
IC			
SV			
IFF			
UHF-1			
UHF-2			

NAVIGATION

RS	Ground Mapping Update of INS	X	X
RA-1			
RA-2			
INS	Precise Navigation	X	X
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			

TARGET ACQUISITION

RS
RA-1
RA-2
INS
OMEGA
TACAN
SKE
RB

VEHICLE DEFENSE

IC
SV
IFF
ESM
ID

MISSION MANAGEMENT

RS
SKE
ILS-1
ILS-2
TACAN

MISSION FUNCTION: RESUPPLY - ROAD LAND MODE: Descend

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSOS)	FLIGHT ESSENT	MISSION ESSENT
--------------------------	----------------------------------	------------------	-------------------

COMMUNICATION

PA			
HF/SSB			
VHF/AM	Enroute Reporting	X	
VHF/FM			
IC			
SV			
IFF			
UHF-1			
UHF-2			

NAVIGATION

RS	Update INS	X	X
RA-1			
RA-2			
INS	Precise Navigation	X	X
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			

TARGET ACQUISITION

RS
RA-1
RA-2
INS
OMEGA
TACAN
SKE
RB

VEHICLE DEFENSE

IC
SV
IFF
ESM
ID

MISSION MANAGEMENT

RS
SKE
ILS-1
ILS-2
TACAN

MISSION FUNCTION: RESUPPLY - ROAD LAND MODE: Approach and Landing

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
--------------------------	----------------------------------	------------------	-------------------

COMMUNICATION

PA			
HF/SSB			
VHF/AM			
VHF/FM	Communicate with Military Ground		X
IC			
SV			
IFF			
UHF-1			
UHF-2			

NAVIGATION

RS	Locate Landing Area		X
RA-1	Altitude Above Terrain	X	
RA-2			
INS			
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			

TARGET ACQUISITION

RS			
RA-1			
RA-2			
INS			
OMEGA			
TACAN			
SKE			
RB			

VEHICLE DEFENSE

IC			
SV			
IFF			
ESM			
ID			

MISSION MANAGEMENT

RS			
SKE			
ILS-1			
ILS-2			
TACAN			

MISSION FUNCTION: ROAD LANDING/
DELIVERY

MODE: Take Off/Climb

EQUIPMENT (MAJ FUNCT) REQUIRED FUNCTION
(FROM FSIDS)

FLIGHT MISSION
ESSENT ESSENT

COMMUNICATION

PA
HF/SSB
VHF/AM
VHF/FM
IC
SV
IFF
UHF-1
UHF-2

Comm-Tower, Dep. Control, Rep. Points

X

X

NAVIGATION

RS
RA-1
RA-2
INS
OMEGA
UHF/ADF
LF/ADF
TACAN
SKE

X

X

TARGET ACQUISITION

RS
RA-1
RA-2
INS
OMEGA
TACAN
SKE
RB

VEHICLE DEFENSE

IC
SV
IFF
ESM
ID

MISSION MANAGEMENT

RS
SKE
ILS-1
ILS-2
TACAN

MISSION FUNCTION: RESUPPLY - ROAD LAND MODE: Cruise

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
--------------------------	----------------------------------	------------------	-------------------

COMMUNICATION

PA			
HF/SSB	Communicate with ALCE		X
VHF/AM	Enroute Reporting		X
VHF/FM			
IC			
SV			
IFF			
UHF-1			
UHF-2			

NAVIGATION

RS	Ground Mapping Update of INS	X	X
RA-1			
RA-2			
INS	Precise Navigation	X	X
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			

TARGET ACQUISITION

RS			
RA-1			
RA-2			
INS			
OMEGA			
TACAN			
SKE			
RB			

VEHICLE DEFENSE

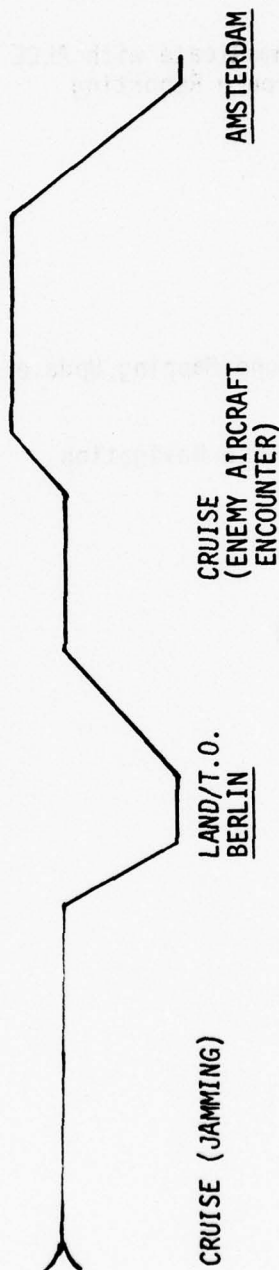
IC			
SV			
IFF			
ESM			
ID			

MISSION MANAGEMENT

RS			
SKE			
ILS-1			
ILS-2			
TACAN			

IDAMST SCENARIO MISSIONS

<u>NO.</u>	<u>MISSION</u>	<u>MODES</u>
9.	SPECIAL CONDITIONS D5A TO/FROM BERLIN CORRIDOR OPERATIONS	(1) Cruise, (2) Radio Frequency Jamming, (3) Enemy Aircraft Encounter



MISSION FUNCTION: DEPLOY, EVACUATION - AIRLAND MODE: RF JAMMING, ENEMY A/C ENCOUNTER
 MODES: Cruise (RF Jamming) Land, T.O./Climb, Cruise (Enemy A/C Encounter)

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
--------------------------	----------------------------------	------------------	-------------------

COMMUNICATION

PA			
HF/SSB	Communicate with ALCE		X
VHF/AM	Enroute Reporting		X
VHF/FM			
IC			
SV			
IFF	Aircraft Position/Identification		X
UHF-1			
UHF-2			

NAVIGATION

RS	Update INS		X
RA-1			
RA-2			
INS	Precise Navigation		X
OMEGA	Locate Reporting Points		X
UHF/ADF			
LF/ADF			
TACAN			

TARGET ACQUISITION

RS			
RA-1			
INS			
OMEGA			
TACAN			
SKE			
RB			

VEHICLE DEFENSE

IC			
SV			
IFF	Transmit Harrass Signal/Mode 3 Code 40		X
ESM			
ID			

MISSION MANAGEMENT

RS			
SKE			
ILS-1	ILS Landing - Berlin		X
ILS-2			
TACAN			

MISSION FUNCTION: DEPLOY, EVACUATION MODE: Cruise

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSOS)	FLIGHT ESSENT	MISSION ESSENT
--------------------------	----------------------------------	------------------	-------------------

COMMUNICATION

PA			
HF/SSB	Communicate with ALCE		X
VHF/AM	Enroute Reporting		X
VHF/FM			
IC			
SV			
IFF			
UHF-1			
UHF-2			

NAVIGATION

RS	Ground Mapping Update of INS	X	X
RA-1			
RA-2			
INS	Precise Navigation	X	X
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			

TARGET ACQUISITION

RS
RA-1
RA-2
INS
OMEGA
TACAN
SKE
RB

VEHICLE DEFENSE

IC
SV
IFF
ESM
ID

MISSION MANAGEMENT

RS
SKE
ILS-1
ILS-2
TACAN

MISSION FUNCTION: DEPLOY, EVACUATION

MODE: RF JAMMING

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
--------------------------	----------------------------------	------------------	-------------------

COMMUNICATION

PA
HF/SSB
VHF/AM
VHF/FM
IC
SV
IFF
UHF-1
UHF-2

Aircraft/Posotion Identification

X

X

NAVIGATION

RS
RA-1
RA-2
INS
OMEGA
UHF/ADF
LF/ADF
TACAN

Update INS

X

X

Navigate thru Area

X

X

TARGET ACQUISITION

RS
RA-1
RA-2
INS
OMEGA
TACAN
SKE
RB

VEHICLE DEFENSE

IC
SV
IFF
ESM
ID

MISSION MANAGEMENT

RS
SKE
ILS-1
ILS-2
TACAN

MISSION FUNCTION: DEPLOY, EVACUATION MODE: Approach and Landing

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
--------------------------	----------------------------------	------------------	-------------------

COMMUNICATION

PA			
HF/SSB			
VHF/AM	Traffic Control, Military & Commercial	X	X
VHF/FM			
IC			
SV			
IFF			
UHF-1			
UHF-2			

NAVIGATION

RS			
RA-1			
RA-2			
INS			
OMEGA			
UHF/ADF	Determine Location of Reporting Point	X	X
LF/ADF			
TACAN			

TARGET ACQUISITION

RS			
RA-1			
RA-2			
INS			
OMEGA			
TACAN			
SKE			
RB			

VEHICLE DEFENSE

IC			
SV			
IFF			
ESM			
ID			

MISSION MANAGEMENT

RS			
SKE			
ILS-1	Instrument Landing System for IFR Conditions - Fixed or Portable	X	X
TACAN			

MISSION FUNCTION: DEPLOY, EVACUATION MODE: Take Off/Climb

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
--------------------------	----------------------------------	------------------	-------------------

COMMUNICATION

PA			
HF/SSB			
VHF/AM	Comm-Tower, Dep. Control, Rep. Points	X	X
VHF/FM			
IC			
SV			
IFF			
UHF-1			
UHF-2			

NAVIGATION

RS
RA-1
RA-2
INS
OMEGA
UHF/ADF
LF/ADF
TACAN

TARGET ACQUISITION

RS
RA-1
RA-2
INS
OMEGA
TACAN
SKE
RB

VEHICLE DEFENSE

IC
SV
IFF
ESM
ID

MISSION MANAGEMENT

RS
SKE
ILS-1
ILS-2
TACAN

MISSION FUNCTION: DEPLOY, EVACUATION MODE: Cruise

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSDS)	FLIGHT ESSENT	MISSION ESSENT
--------------------------	----------------------------------	------------------	-------------------

COMMUNICATION

PA			
HF/SSB			
VHF/AM	Enroute Reporting	X	
VHF/FM			
IC			
SV			
IFF			
UHF-1			
UHF-2			

NAVIGATION

RS			
RA-1			
RA-2			
INS	Precise Navigation	X	X
OMEGA			
UHF/ADF			
LF/ADF			
TACAN			

TARGET ACQUISITION

RS
RA-1
RA-2
INS
OMEGA
TACAN
SKE
RB

VEHICLE DEFENSE

IC
SV
IFF
ESM
ID

MISSION MANAGEMENT

RS
SKE
ILS-1
ILS-2
TACAN

MISSION FUNCTION: DEPLOY, EVACUATION

MODE: ENEMY A/C ENCOUNTER

EQUIPMENT (MAJ FUNCT)	REQUIRED FUNCTION (FROM FSIDS)	FLIGHT ESSENT	MISSION ESSENT
--------------------------	-----------------------------------	------------------	-------------------

COMMUNICATION

PA
HF/SSB
VHF/AM
VHF/FM
IC
SV
IFF
UHF-1
UHF-2

Aircraft & Position Identification

X X

NAVIGATION

RS
RA-1
RA-2
INS
OMEGA
UHF/ADF
LF/ADF
TACAN

Update INS

X X

Fly Planned Course

X X

TARGET ACQUISITION

RS
RA-1
RA-2
INS
OMEGA
TACAN
SKE
RB

VEHICLE DEFENSE

IC
SV
IFF
ESM
ID

Transmit Harray Signal - Mode 3 Code 40

X X

MISSION MANAGEMENT

RS
SKE
ILS-1
ILS-2
TACAN

APPENDIX B

TO

FINAL TECHNICAL REPORT

FOR

AFAL CONTRACT NUMBER F33615-76-C-1297

IDAMST OPERATIONAL SEQUENCE DIAGRAMS

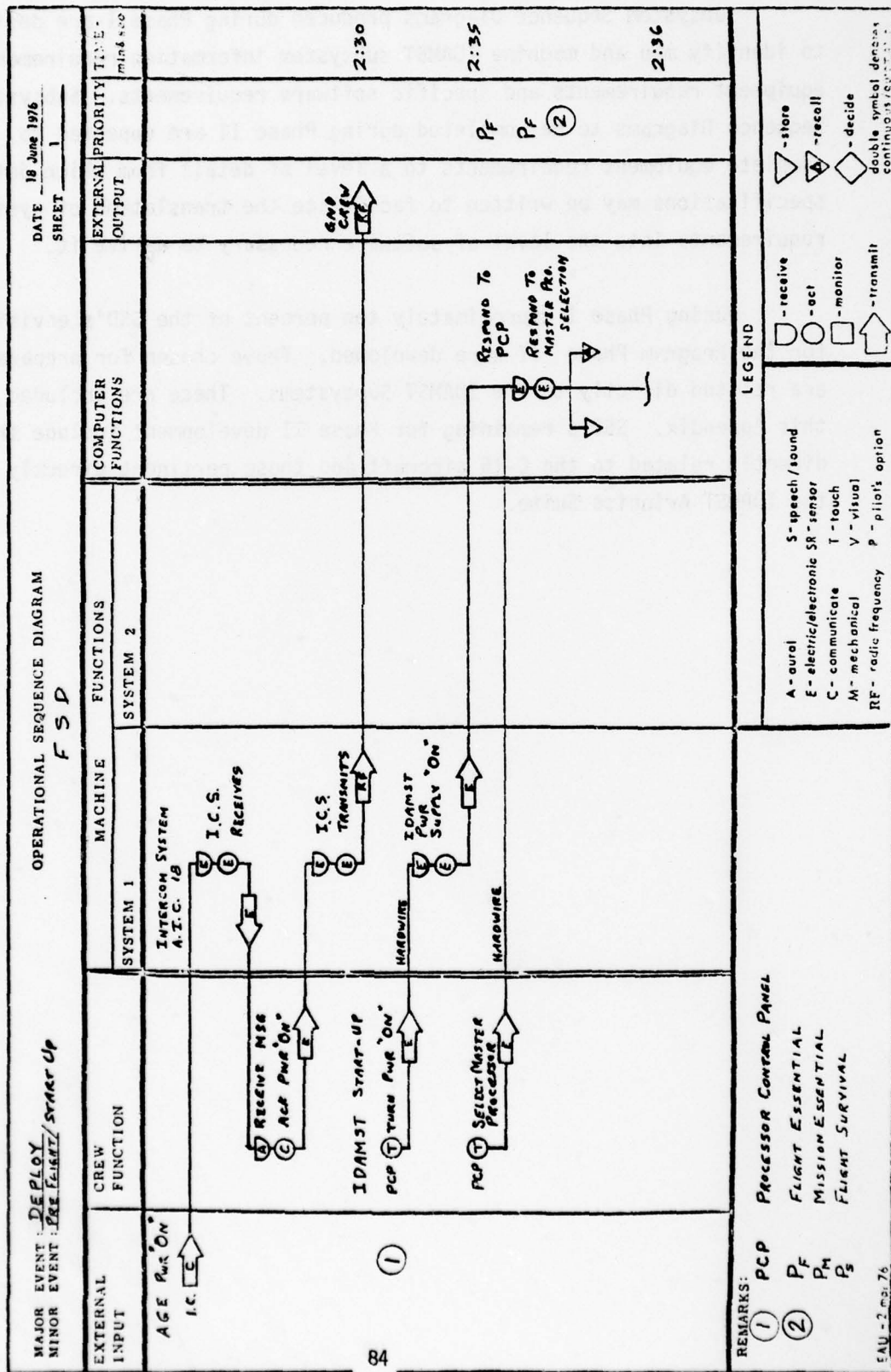
Operational Sequence Diagrams have been developed to reflect the narrative description of the mission operations described in the AMST scenario and where applicable, the influence of the USAF Employment Concept, and the AMST ROC. Operational Sequence Diagrams is the collective name for sequence diagrams designed to address specific levels of detail in the analytical process for determining system (man-machine) requirements. OSD's may be constructed to any level of detail and written to serve different purposes. Functional Sequence Diagrams (FSD's) produced during Phase I are first level OSD's designed to define man and machine system information requirements, task allocations, and general system requirements. Subsystem Sequence Diagrams (SSD's) to be developed during Phase II, partially in Phase I, are expected to produce equipment requirements to a level of detail from which detailed specifications may be written to facilitate the translation of system requirements into the level of software necessary to drive it.

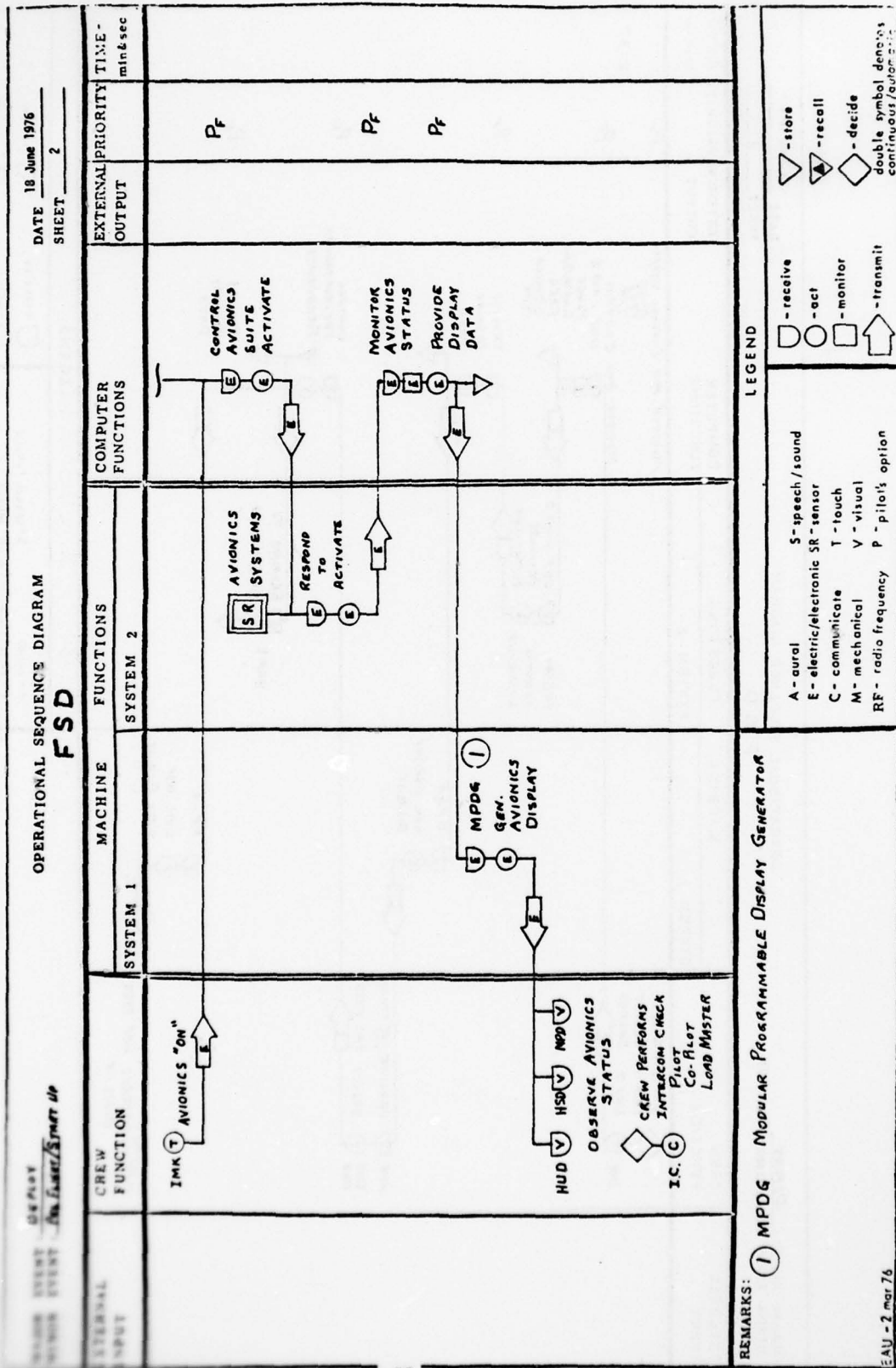
The composite Mission Scenario furnished by the Air Force coupled with functional sequence and systems analysis provides the basis for development of Functional Sequence Diagrams. The scenario events analyzed and plotted in time sequence work sheets provide the data for development of FSD's which may then be used to identify operational level performance requirements including man/machine requirements, task allocations and general equipment requirements.

Each mission phase deployment through D5, has been treated as a major FSD event with the various flight phases treated as minor events. The flight phases constitute IDAMST master modes and correlate with cockpit equipment and software concepts. The minor events within the scenario were sometimes repetitive and were handled via FSD annotation, however, many similar minor events do involve scenario variations thus have been completely diagrammed within the FSD's.

Subsystem Sequence Diagrams produced during Phase I are designed to identify man and machine IDAMST subsystem information requirements, equipment requirements and specific software requirements. Subsystem Sequence Diagrams to be completed during Phase II are expected to complete equipment requirements to a level of detail from which detailed specifications may be written to facilitate the translation of system requirements into the level of software necessary to derive it.

During Phase I approximately ten percent of the SSD's envisioned for the Program Phase II were developed. Those chosen for preparation are related directly to the IDAMST Subsystems. These are included in this Appendix. SSD's remaining for Phase II development include those directly related to the C-15 aircraft and those pertinent directly to the IDAMST Avionics Suite.





OPERATIONAL SEQUENCE DIAGRAM
FSD

MAJOR EVENT: Deploy

MINOR EVENT: Pre-Flight Start Up

OPERATIONAL SEQUENCE DIAGRAM

FSD

DATE: 18 June 1976

SHEET: 3

EXTERNAL INPUT	CREW FUNCTION	MACHINE		COMPUTER FUNCTIONS	EXTERNAL PRIORITY OUTPUT	TIME - min:sec
		SYSTEM 1	SYSTEM 2			
	VHF/AM SELECT UNF 1 SELECT UNF 2 SELECT IMK			MONITOR AND CONTROL VHF/AM FREQ. T/R MONITOR AND CONTROL UNF 1 AND 2 POWER GUARD/AMP FREQ. SQUELCH T/R PROVIDE DISPLAY DATA	Pf	2:37
	MPP OBSERVE UNF STATUS IMK ONK SELECT TAC FREQ.	MPDA GEN. UNF/AM DISPLAY	UNF 1 AND 2 RESUMPS AN/ARC-116 AN/ARC-124		Pf	
	MPP OBSERVE UNF FREQ. DISPLAY	MPDA GEN. UNF FREQ Display	UNF 2 RESUMPS TO FREQ. CHANGE	CONTROL FREQUENCY PROVIDE DISPLAY DATA	Pf	

REMARKS:

LEGEND

A - aural

E - electric/electronic SR - sensor

C - communicate

M - mechanical

RF - radio frequency

S - speech / sound

T - touch

V - visual

P - pilot's option

- store

- recall

- decide

double symbol denotes continuous operation

- receive

- act

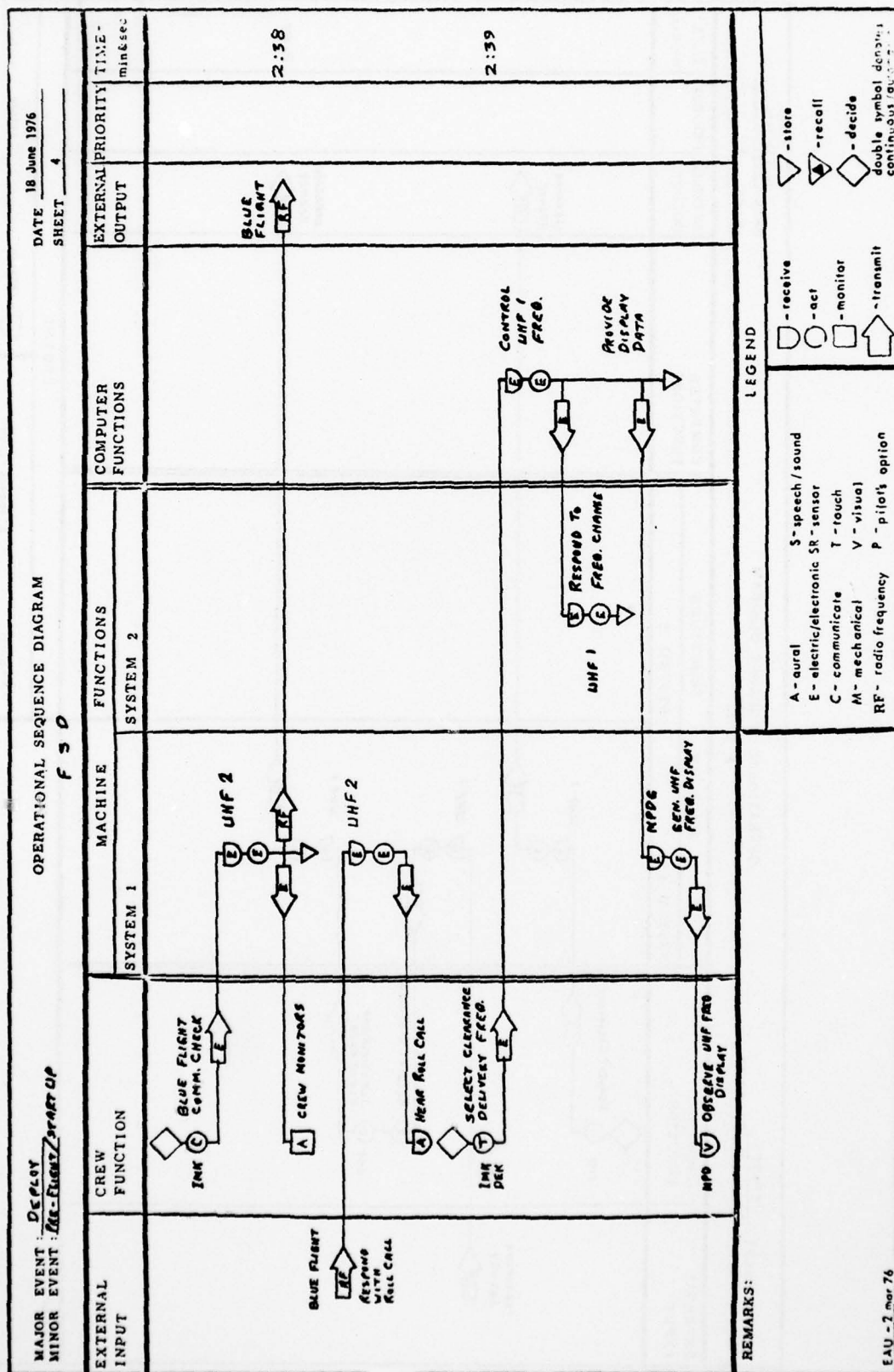
- monitor

- transmit

AU - 2 mar 76

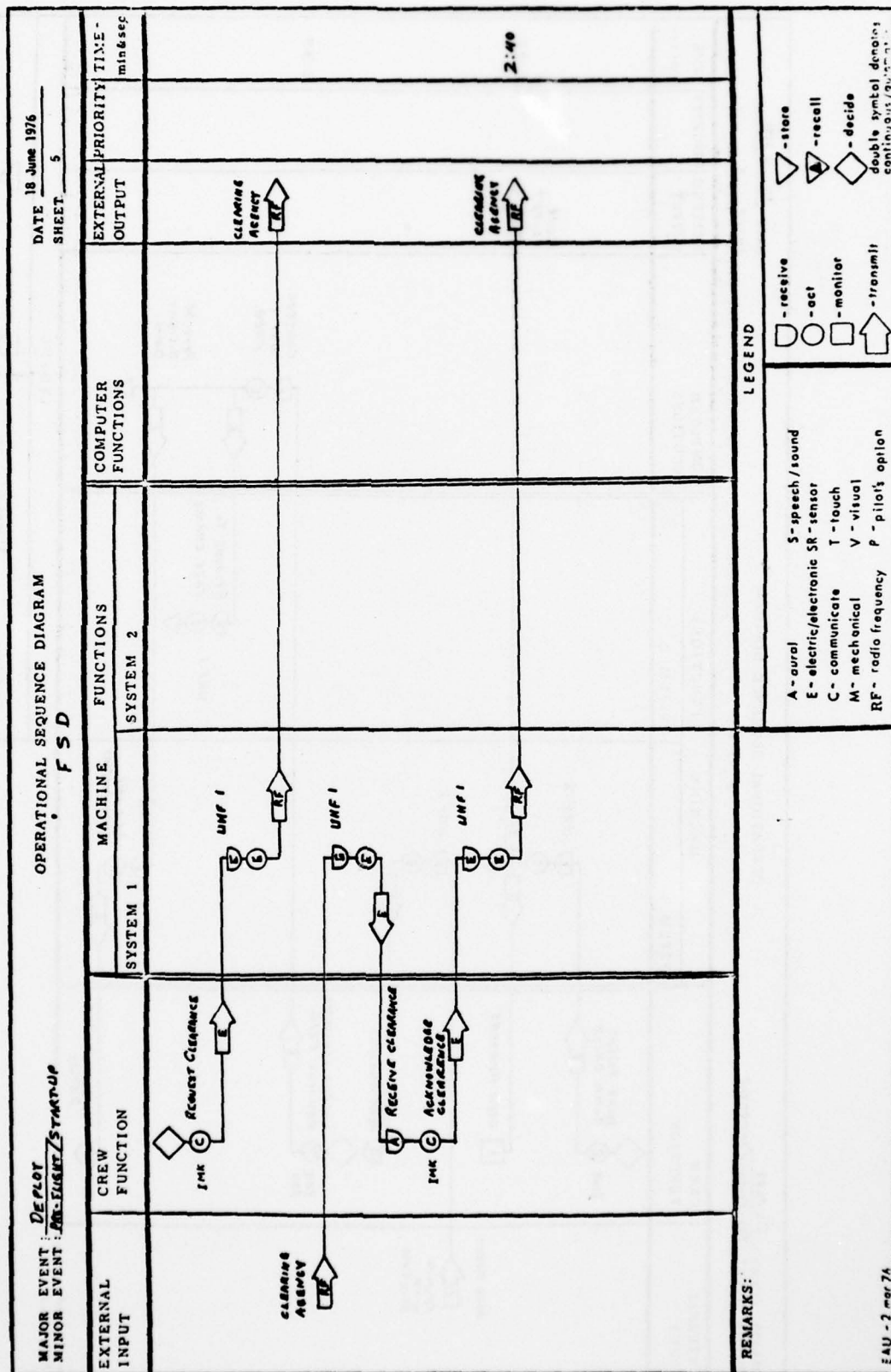
OPERATIONAL SEQUENCE DIAGRAM

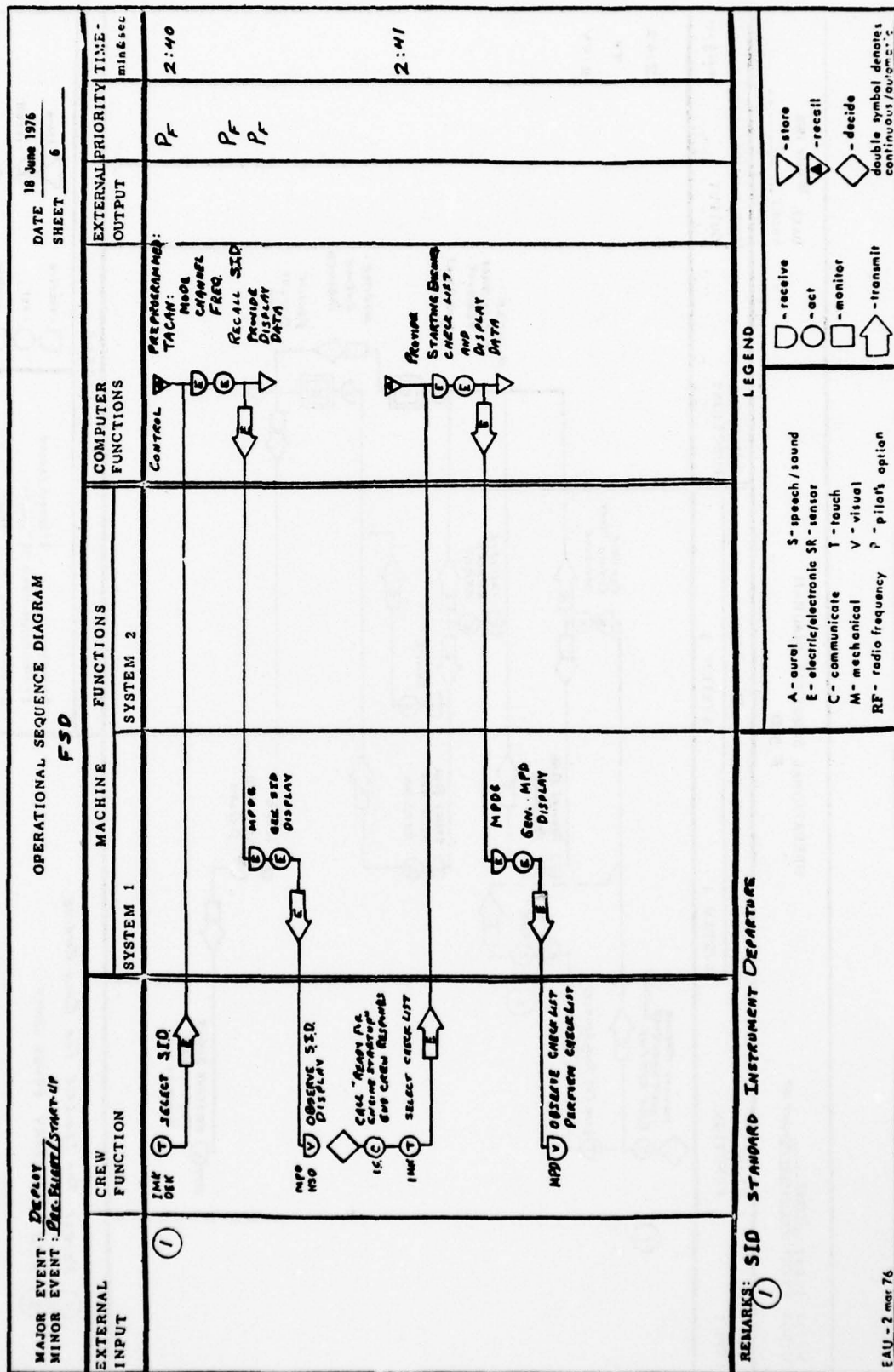
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REMARKS:

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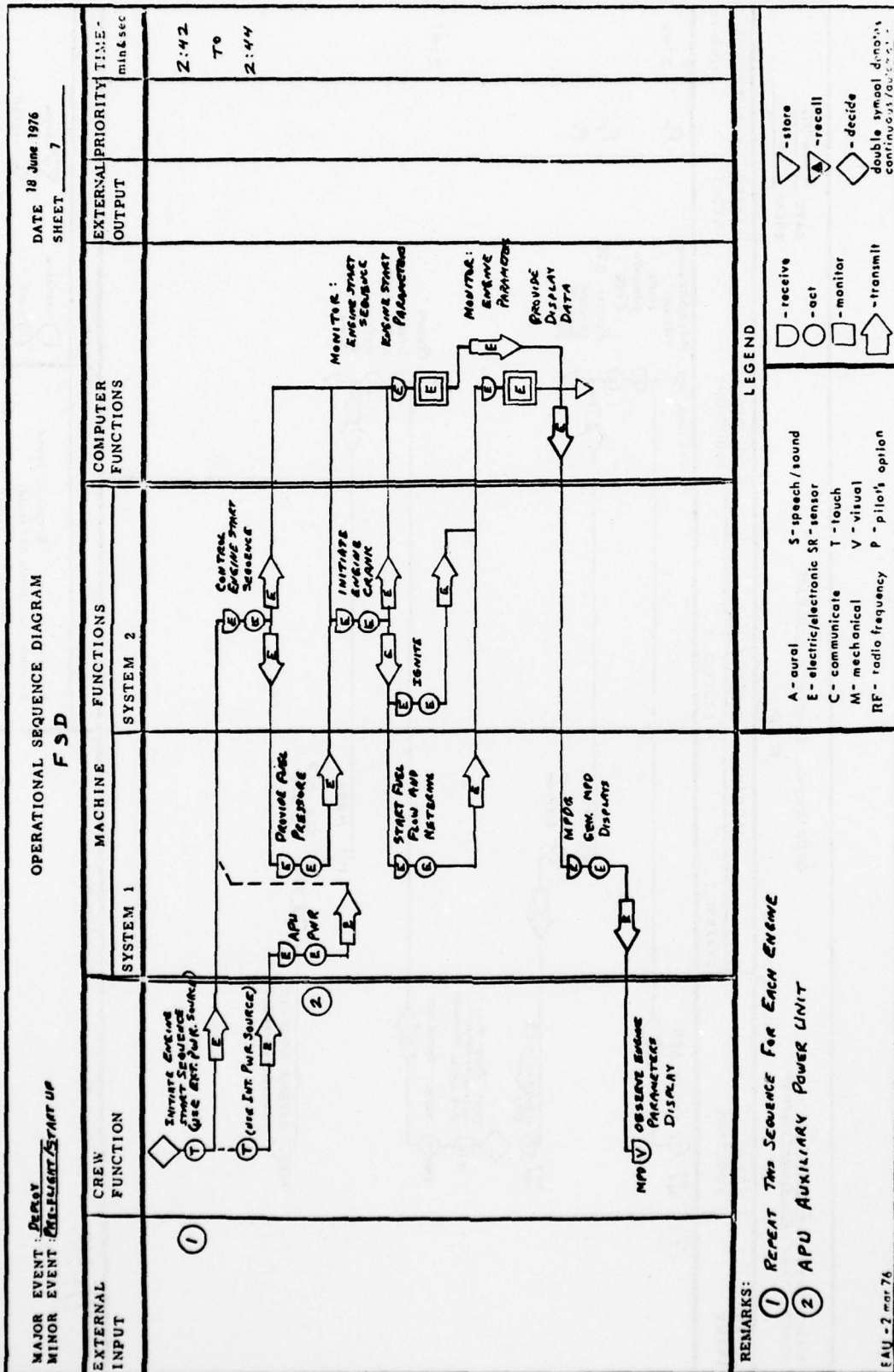




REMARKS: SID STANDARD INSTRUMENT DEPARTURE

(1)

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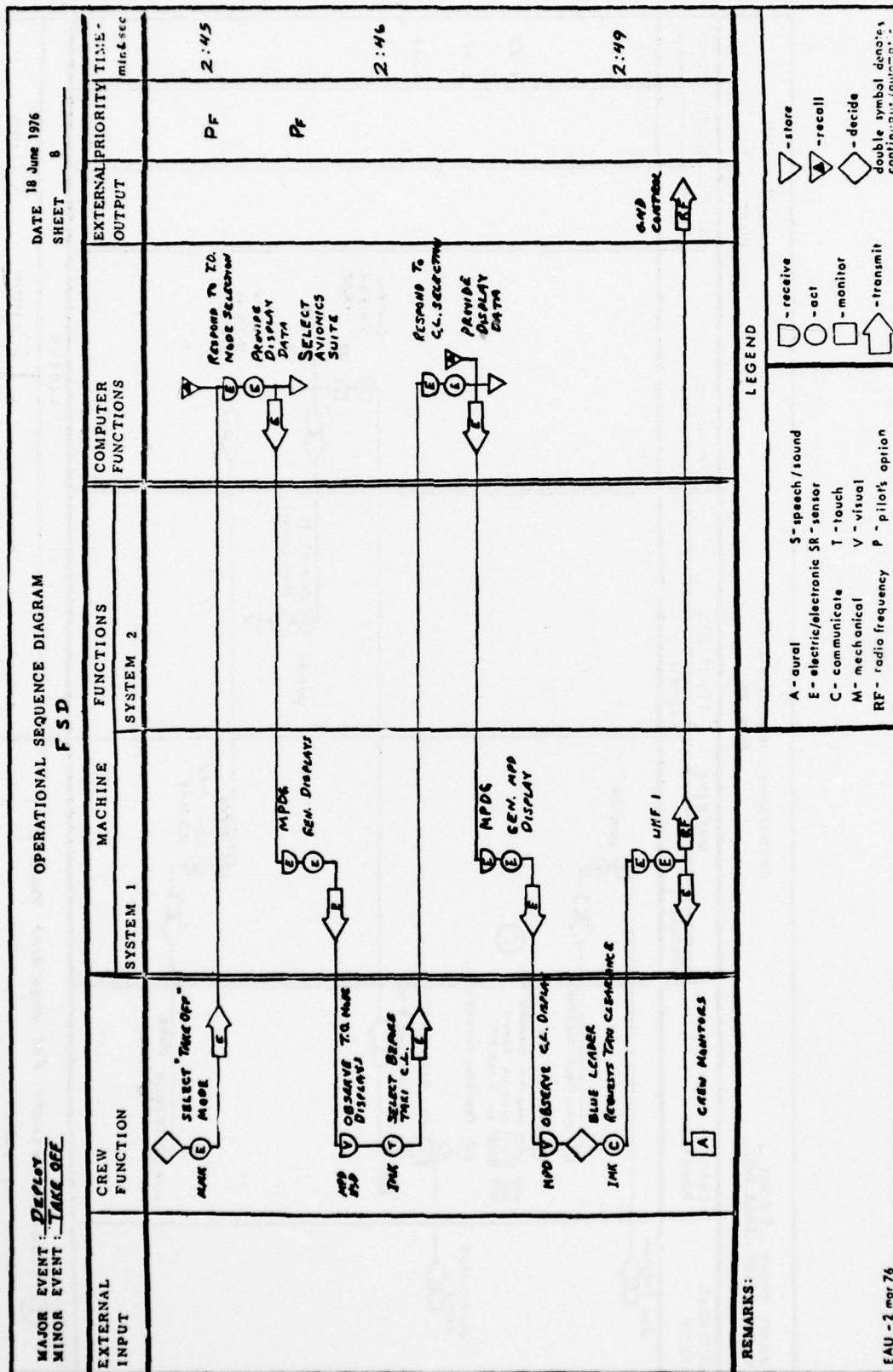


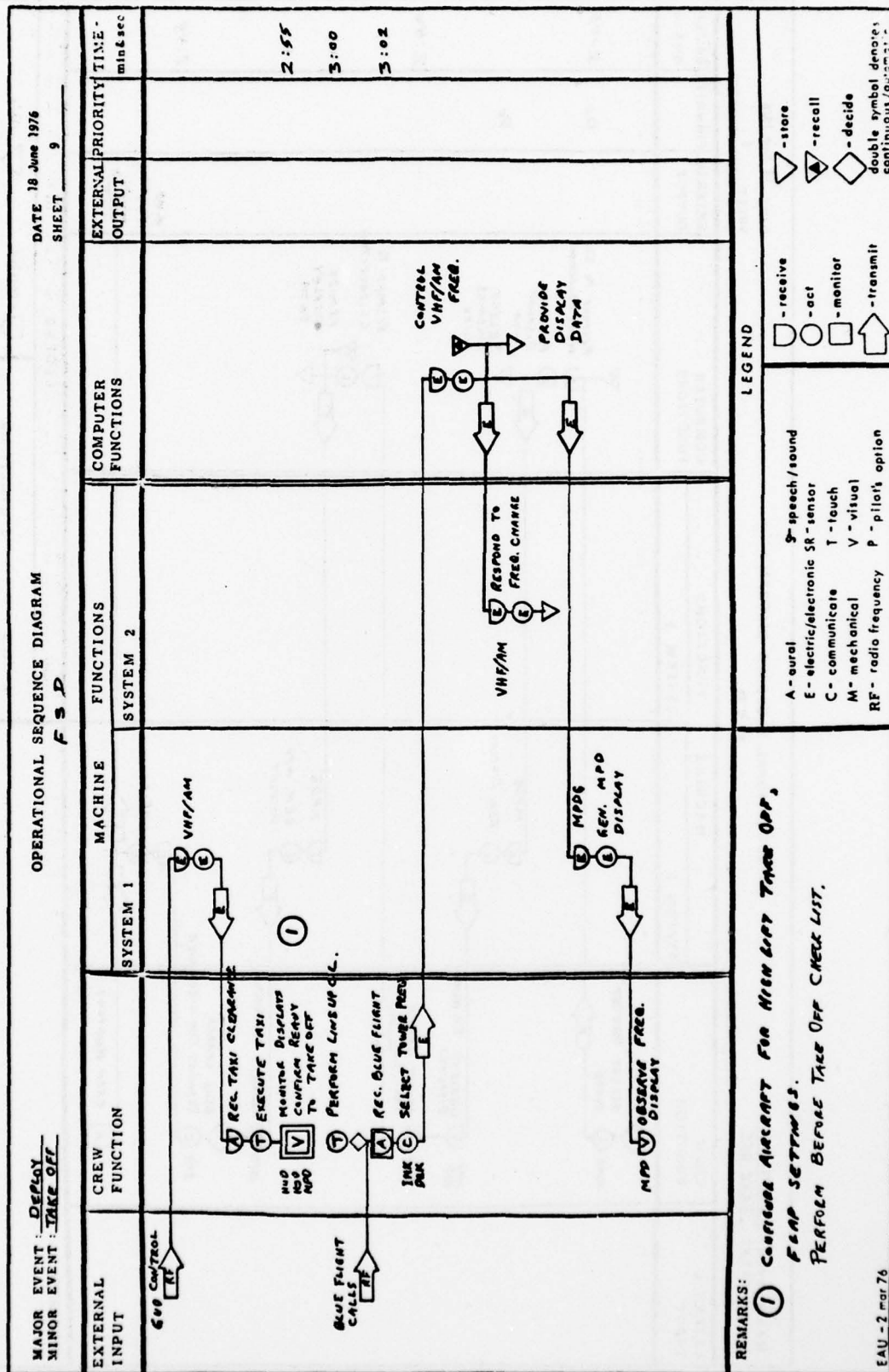
REMARKS:

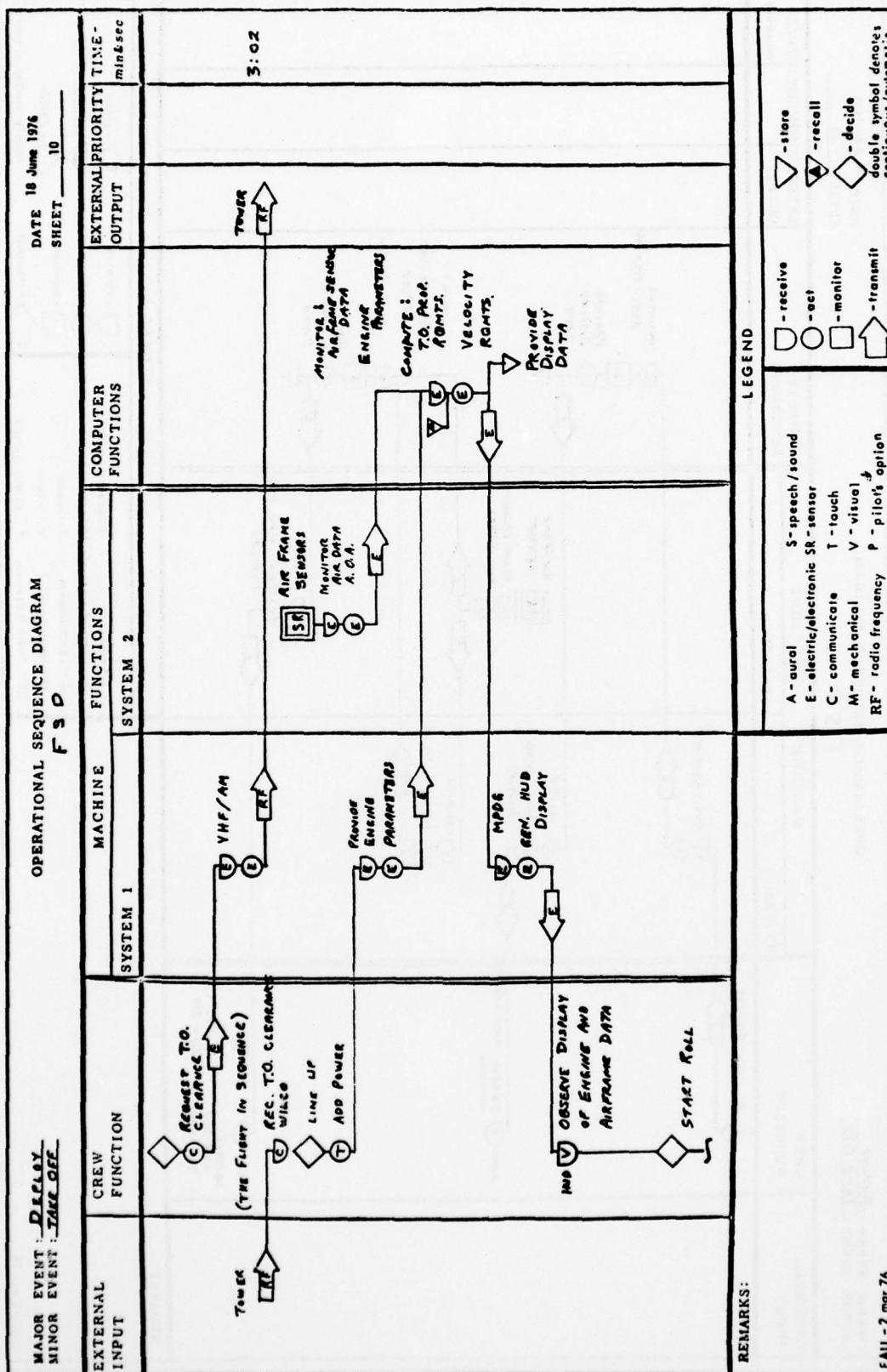
(1) REPEAT THIS SEQUENCE FOR EACH ENGINE

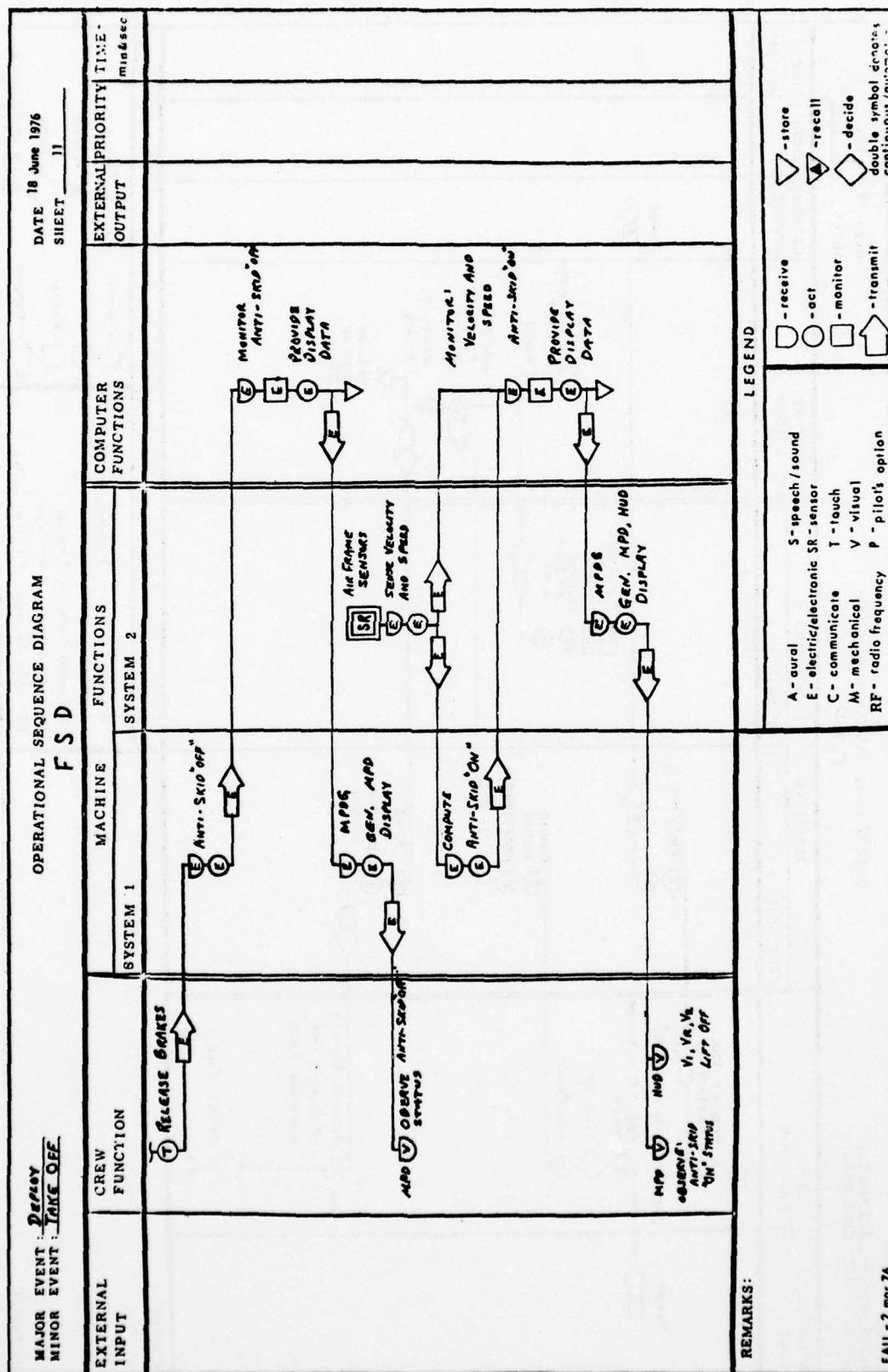
(2) APU AUXILIARY POWER UNIT

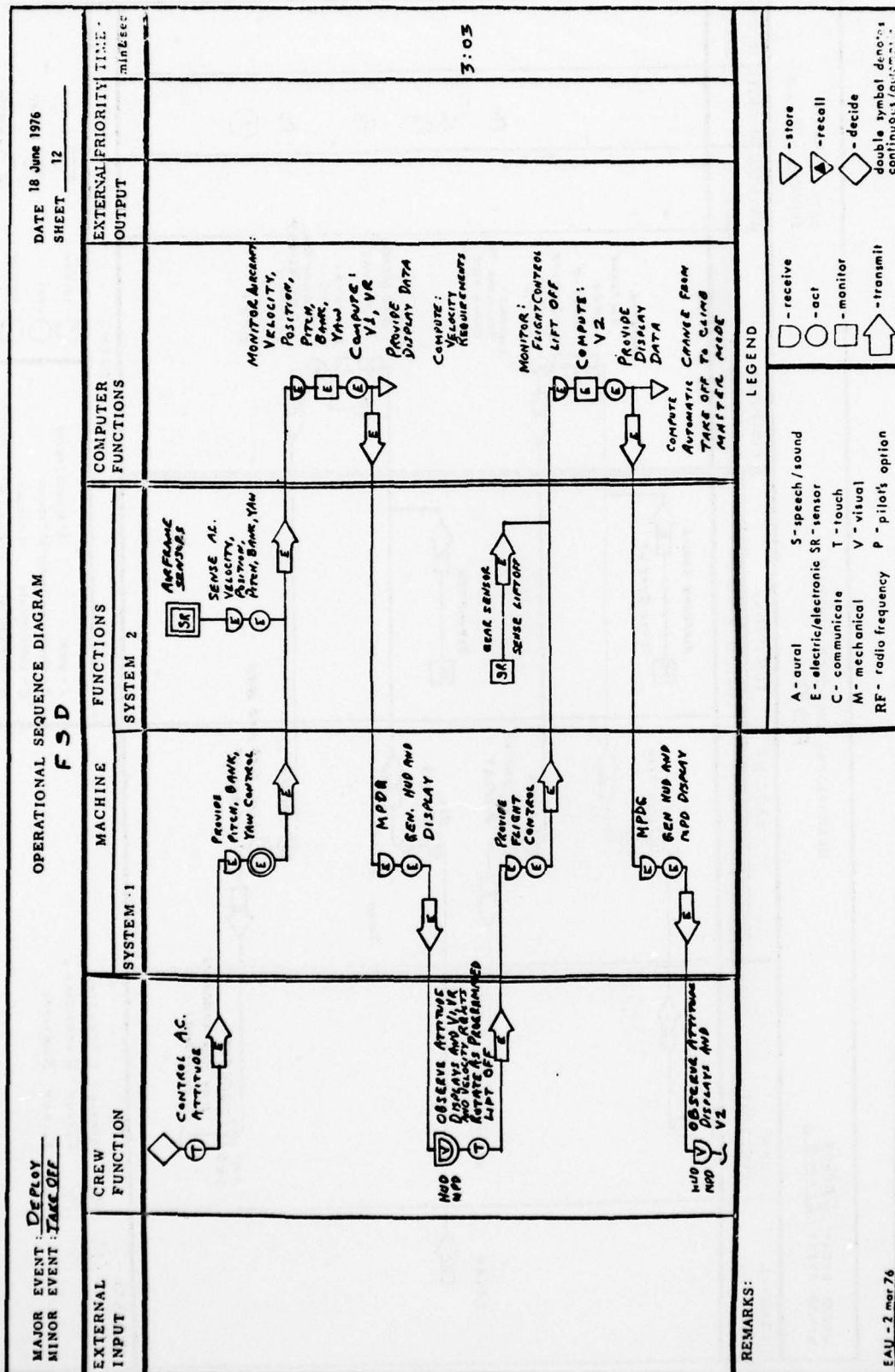
EAU-2 mar 76

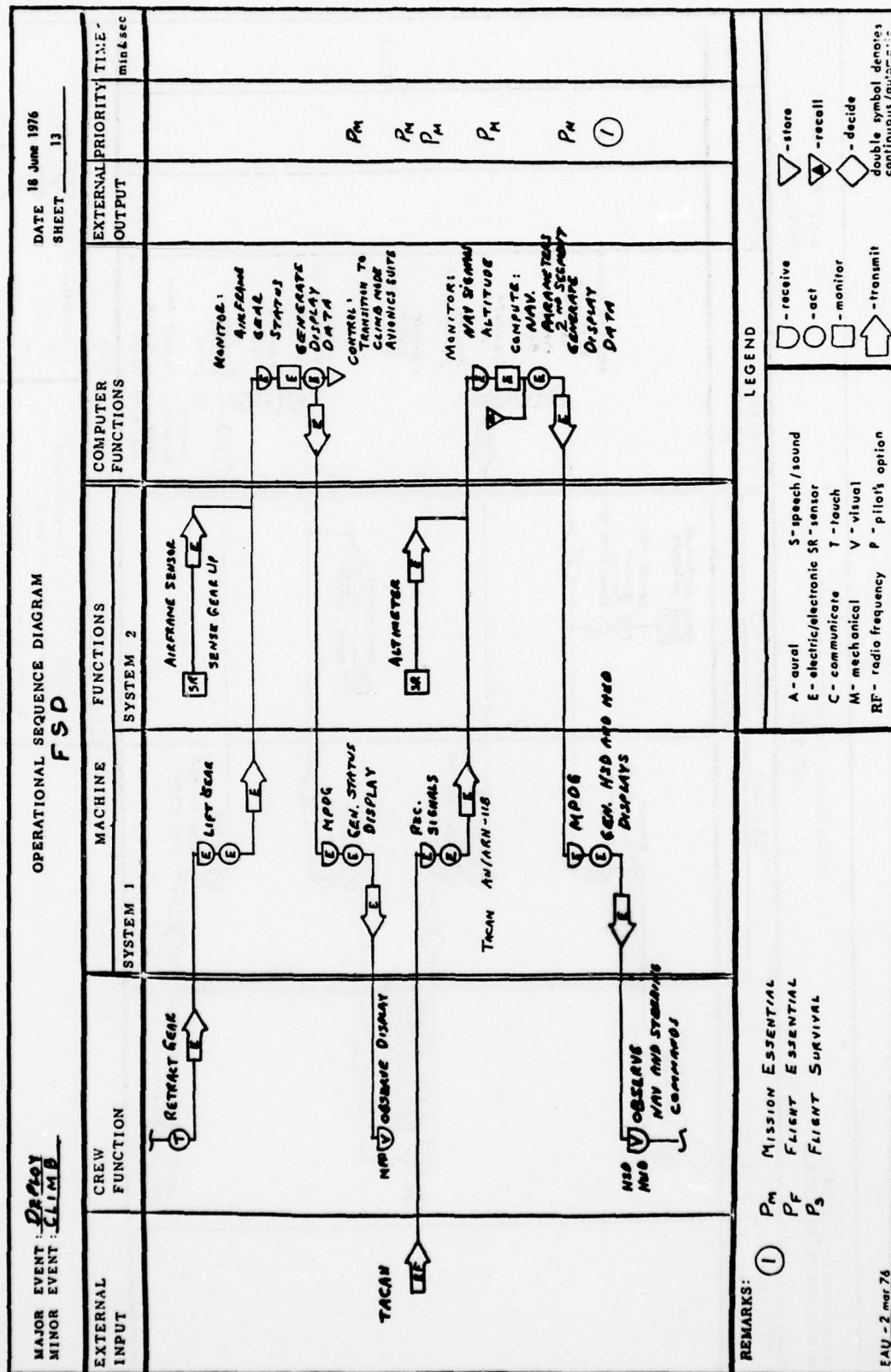


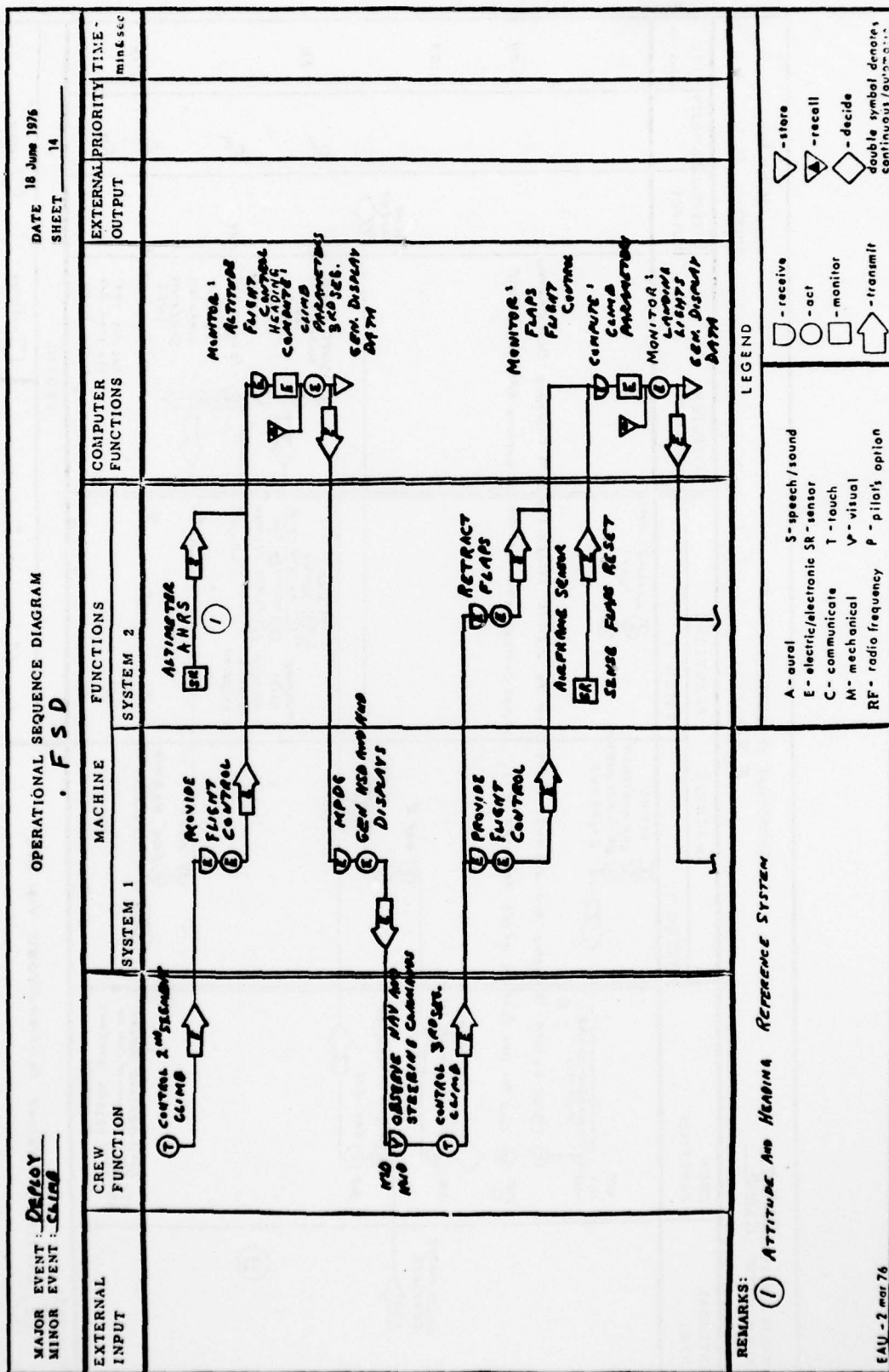












DATE 18 June 1976
SHEET 15

MAJOR	EVENT	Deploy
MINOR	EVENT	Climb

F50

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AD-A045 596

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SPECIFICATIONS FOR IDAMST SOFTWARE. VOLUME II. APPENDICES.(U)

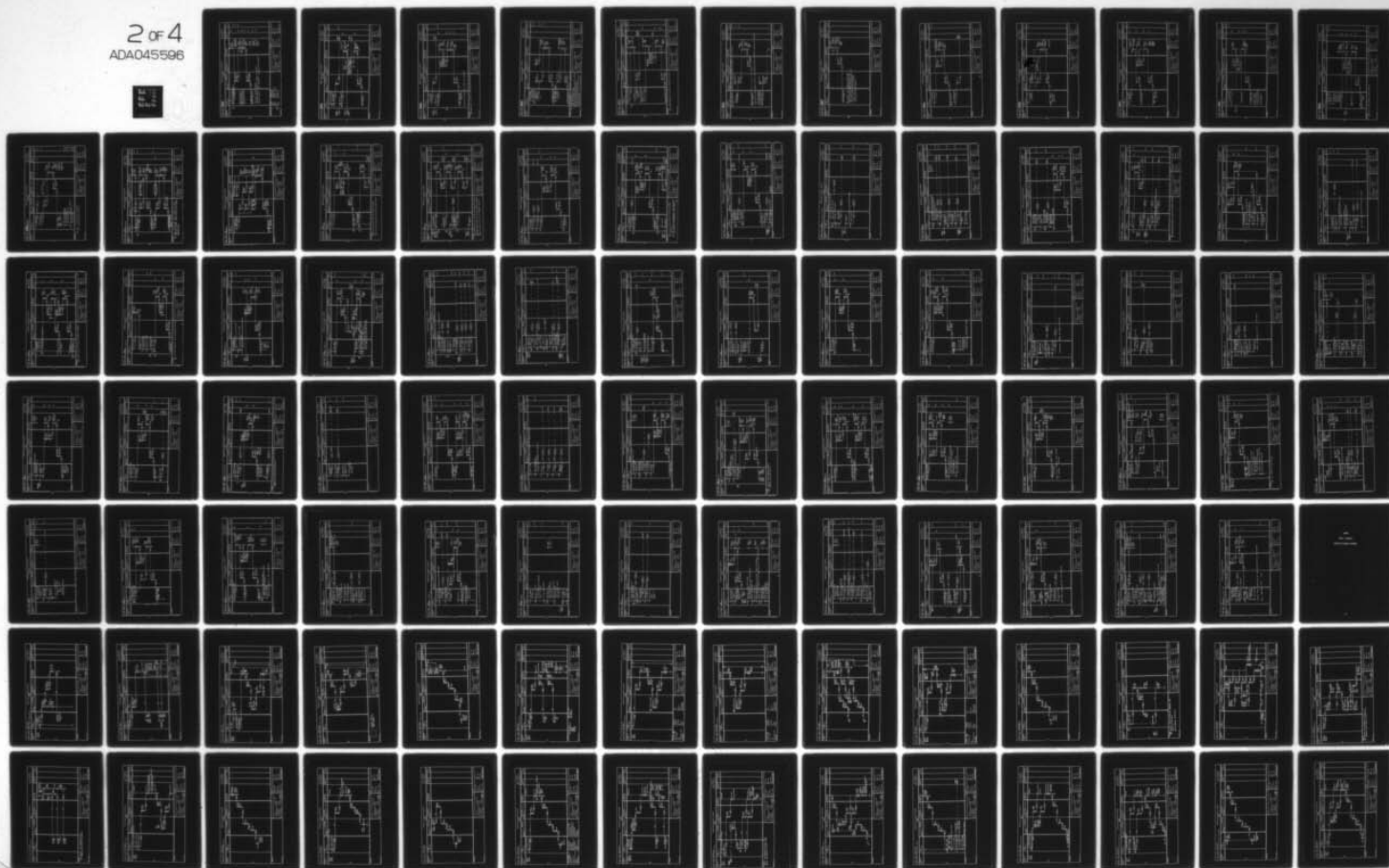
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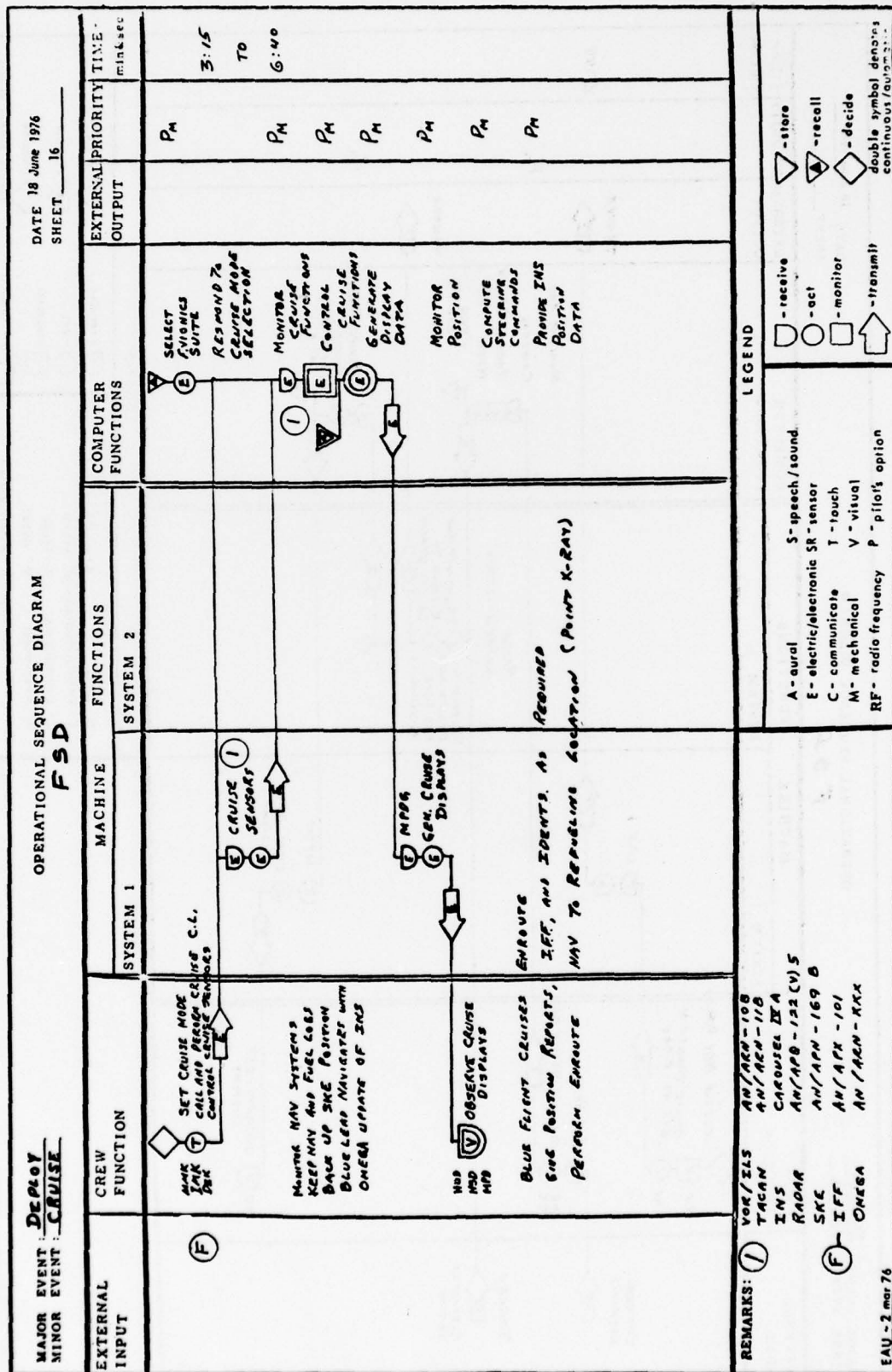
MDC-J7271-VOL-2

AFAL-TR-76-209-VOL-2

NL

2 of 4
ADA045596





FSD

MAJOR	EVENT :	<u>DEPLOY</u>
MINOR	EVENT :	<u>CRUISE</u>

DATE 18 June 1976
SHEET 17

EXTERNAL INPUT	CREW FUNCTION	MACHINE FUNCTIONS		COMPUTER FUNCTIONS	EXTERNAL OUTPUT	PRIORITY	TIME - min&sec
		SYSTEM 1	SYSTEM 2				
TANKER REMAINS	<p>MONITOR NAV DISPLAY</p> <p>ADVISE TANKER OF ETA AT X-RAY</p> <p>INS (V) (C)</p> <p>REC RPLY</p> <p>ACTIVATE BEACON MODE</p> <p>INS DEK (A) (T)</p>	<p>UNF 1</p> <p>RF</p>	<p>MONITOR AND CONTROL RADAR BEAM MODE: FREQ RISE</p>	TANKER	P _M	6:44	
TANKER ACTIVATES BEACON	<p>INS DEK (A) (T)</p> <p>INS (V) (C)</p> <p>NP OBSERVE IFF Display</p>	<p>MPDC</p> <p>GEN. HPD DISPLAY</p>	<p>RADAR AM/APN-122(V)5</p> <p>RESPOND TO TANKER REQUEST AND FEED. THREE BEAM ADJUSTMENT.</p> <p>TRANSMIT AND RESPOND TO TANKER REQUEST</p> <p>ADVISE RADAR BEACON DISPLAY DATA</p>	TANKER	P _M		

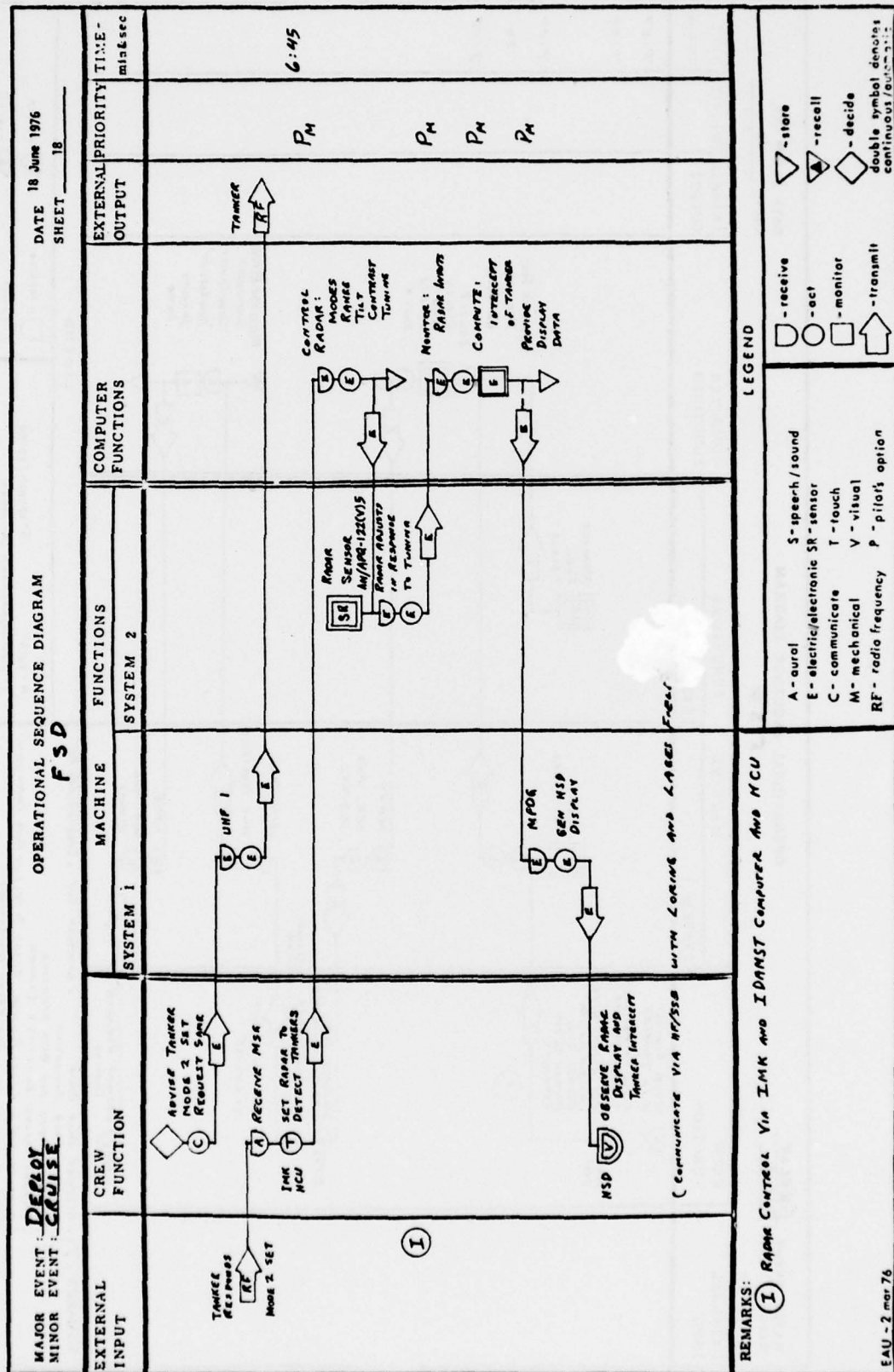
REMARKS:

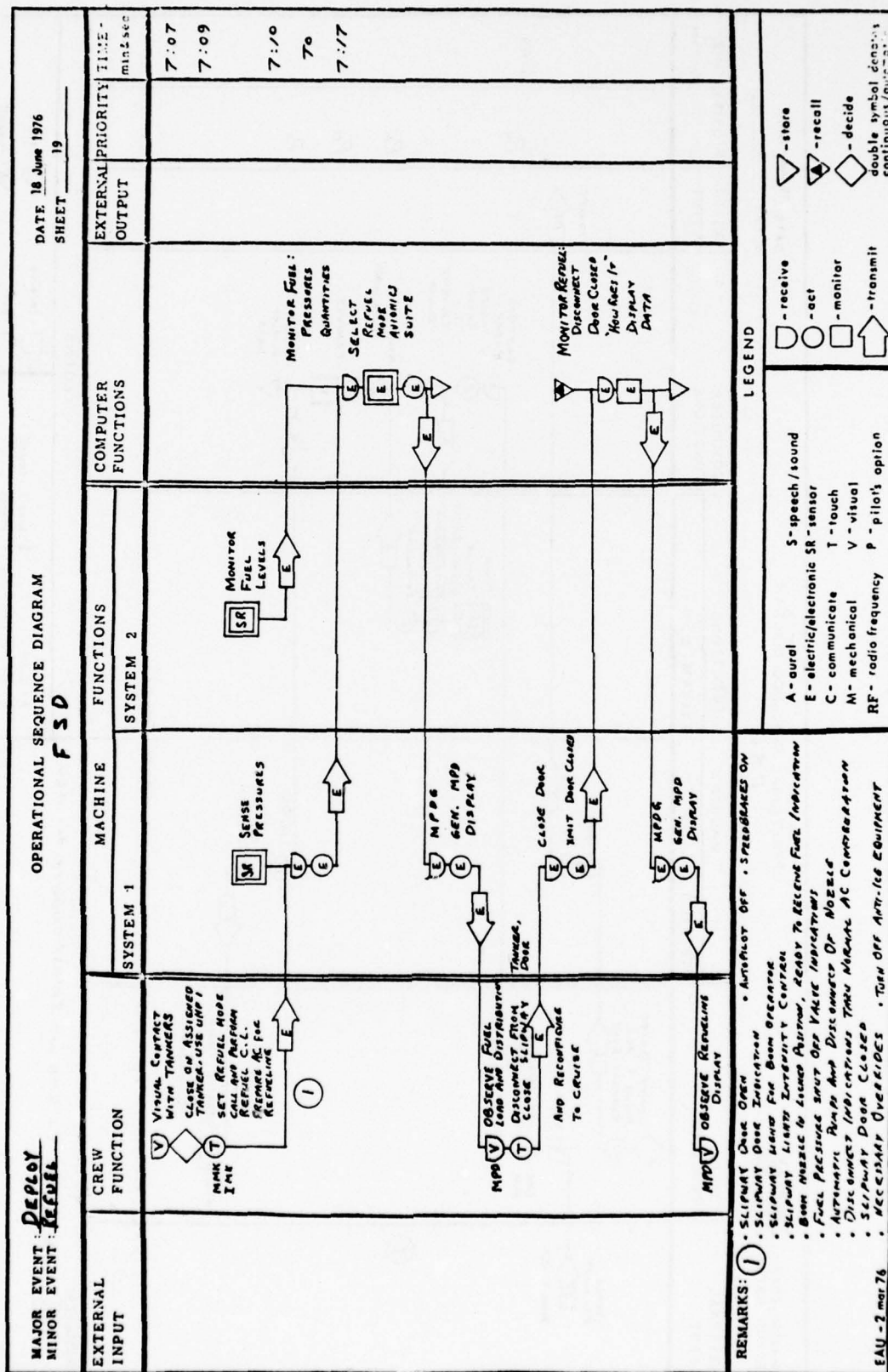
LEGEND

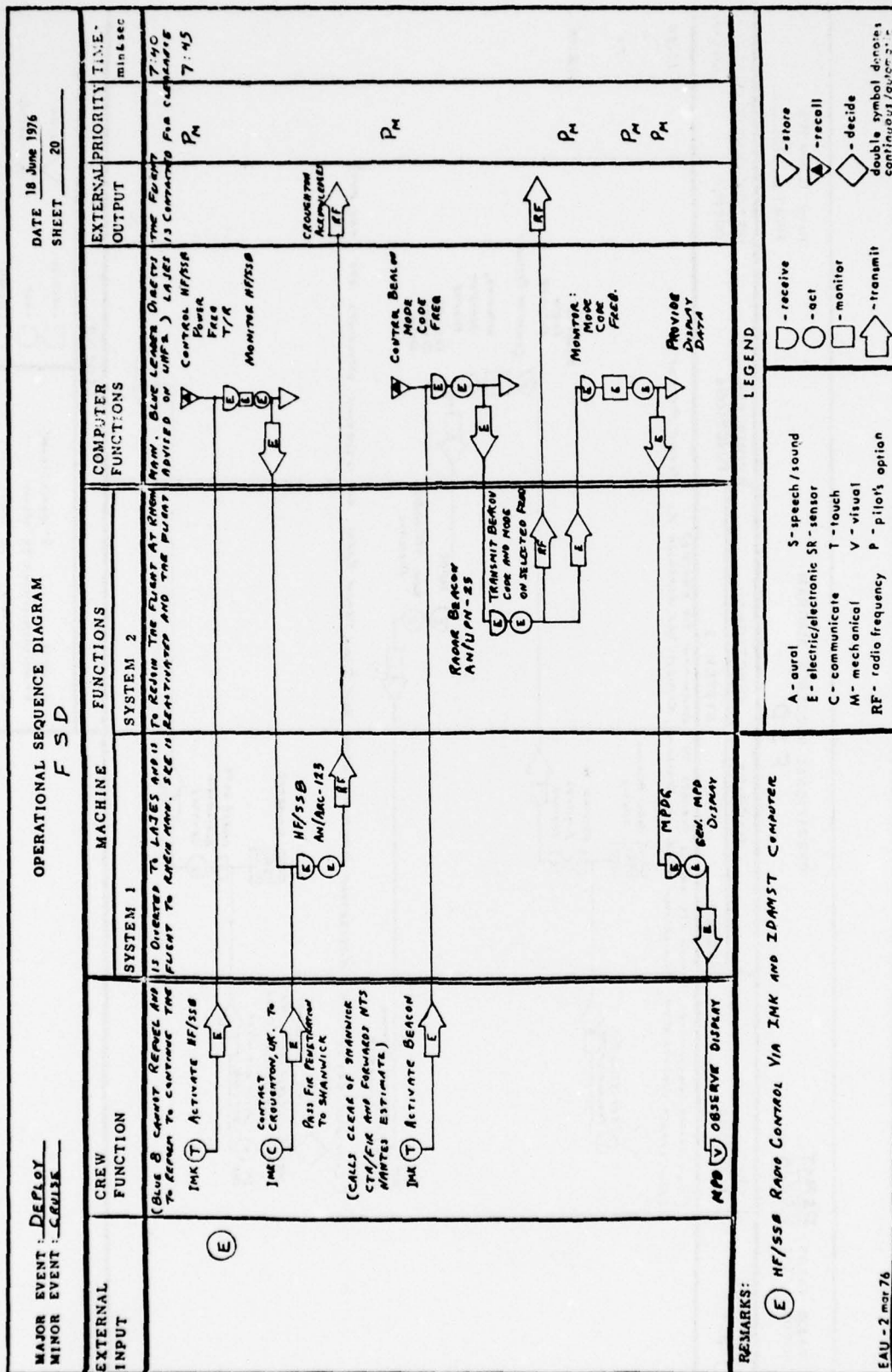
A - aural	S - speech / sound
E - electric/electronic	SR - sensor
C - communicate	T - touch
M - mechanical	V - visual
F - radio frequency	P - pilot's option

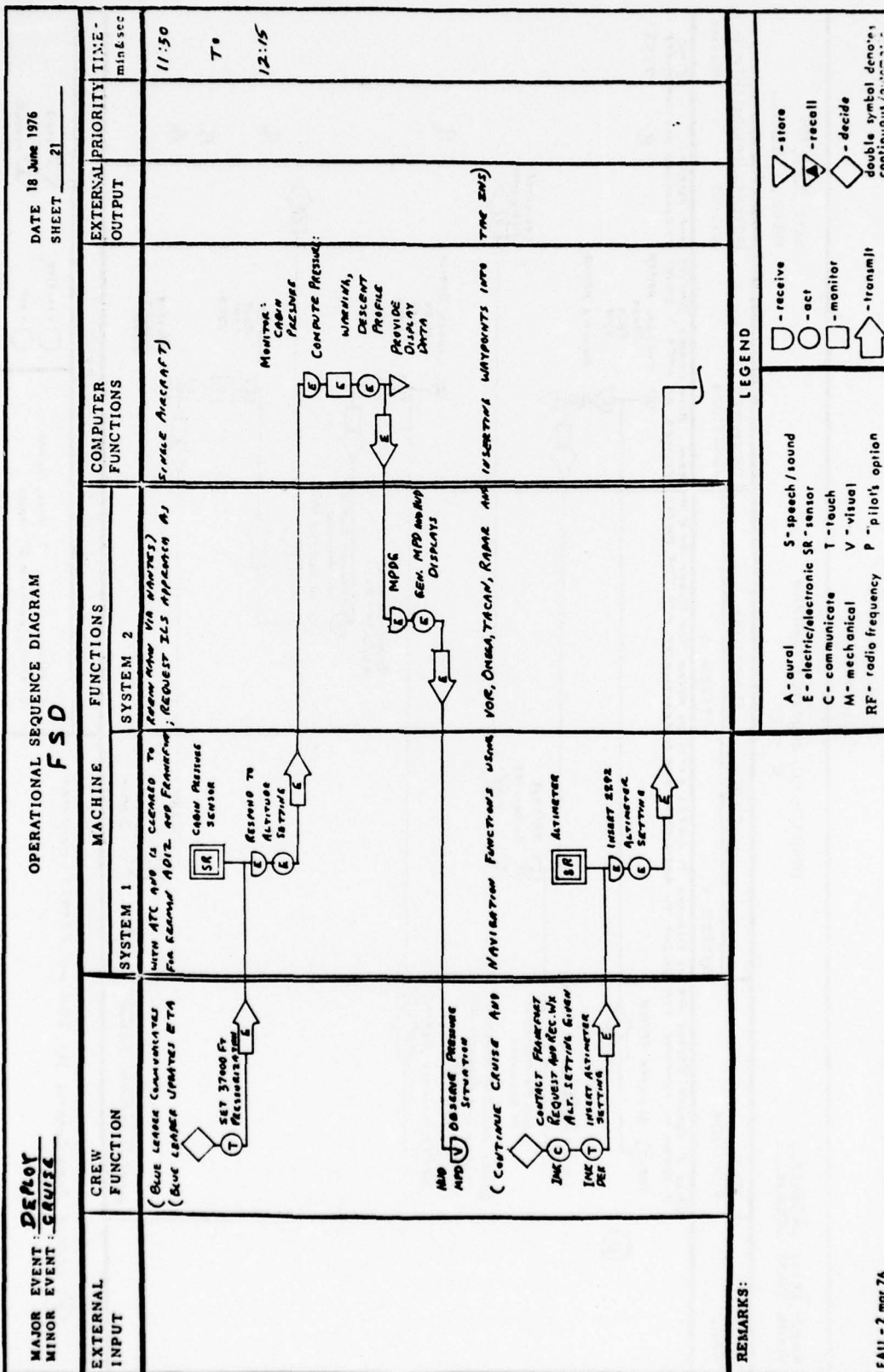
-store
-recall
-decide

EAU - 2 mar 76









EAU - 2 mar 76

MAJOR EVENT: <u>Deploy</u> MINOR EVENT: <u>Cruise</u>		OPERATIONAL SEQUENCE DIAGRAM FSD			DATE 18 June 1976 SHEET 22		
EXTERNAL INPUT	CREW FUNCTION	MACHINE FUNCTIONS		COMPUTER FUNCTIONS	EXTERNAL OUTPUT	PRIORITY	TIME min & sec
		SYSTEM 1	SYSTEM 2				
	<p>HUD (V) OBSERVE ALTITUDE DISPLAY</p> <p>(BLUE LEADER COMMUNICATES WITH ATC AND IS DIRECTED TO CONTACT FFM LEADER ON 200.1 AFSSA CROSSING MATTHEWHEIM RADAR CLEARS BLUE TO 30,000 FT AND HUD FURTHER CLEARANCE ARE EXPECTED. BLUE FLIGHT FORCES)</p>		<p>NPDS</p> <p>GEN. HUD. Display</p>	<p>MONITOR: ALTITUDE AUTIMETER SETTING COMPUTE: TRUE 18000 FT HSE ALTITUDE SWITCH OVER ALTITUDE PROVIDE DISPLAY DATA</p>			
REMARKS:							

LEGEND

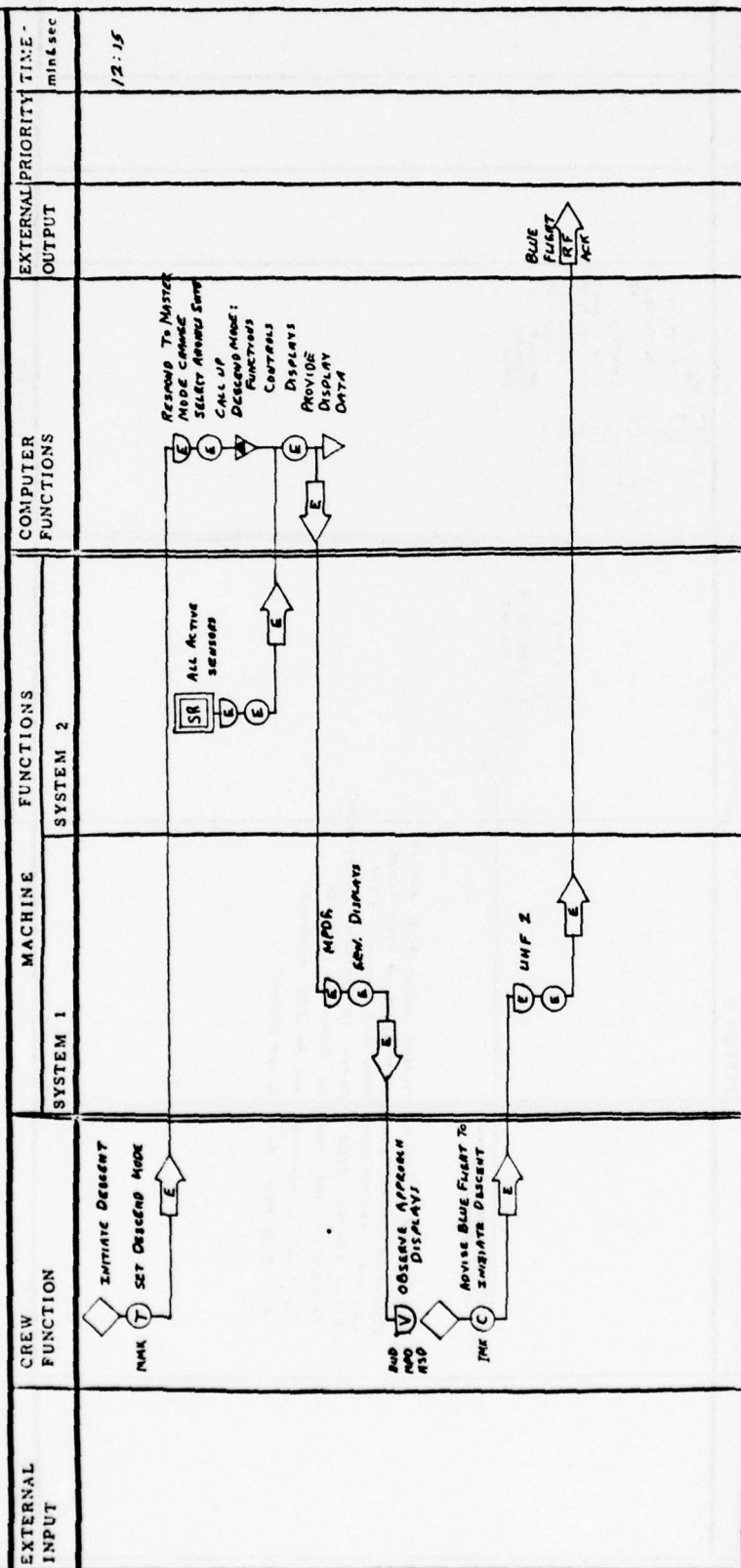
- | | | |
|-------------------------------------|--------------------|---|
| A - aural | S - speech / sound | △ - store |
| E - electric/electronic SR - sensor | | △ - recall |
| C - communicate | T - touch | ◇ - decide |
| M - mechanical | V - visual | double symbol denotes continuous / simultaneous |
| RF - radio frequency | P - pilot's option | |

EAU - 2 mar 76

MAJOR EVENT: Descent
MINOR EVENT: Descent

OPERATIONAL SEQUENCE DIAGRAM
F S D

DATE 18 June 1976
SHEET 23

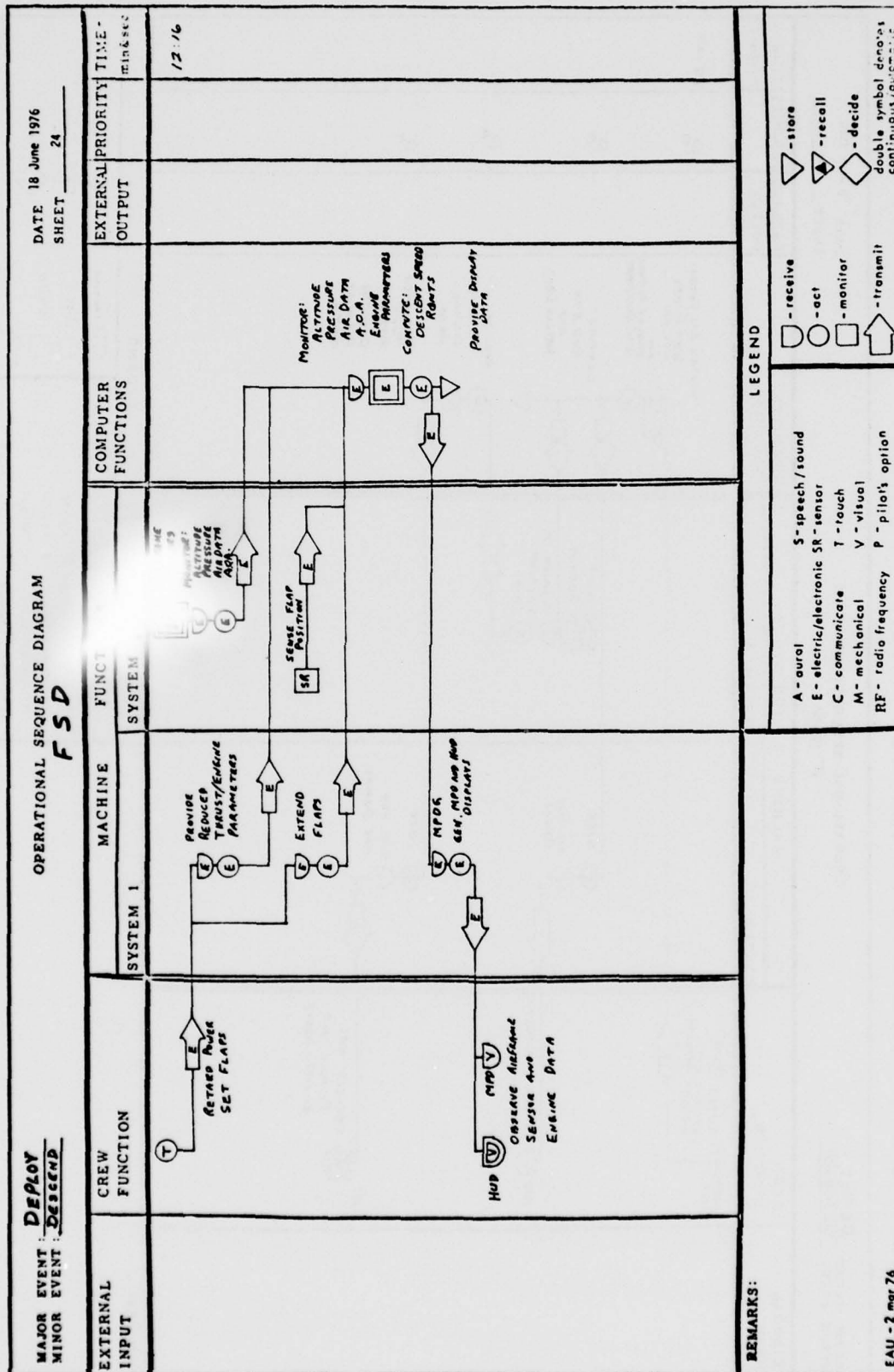


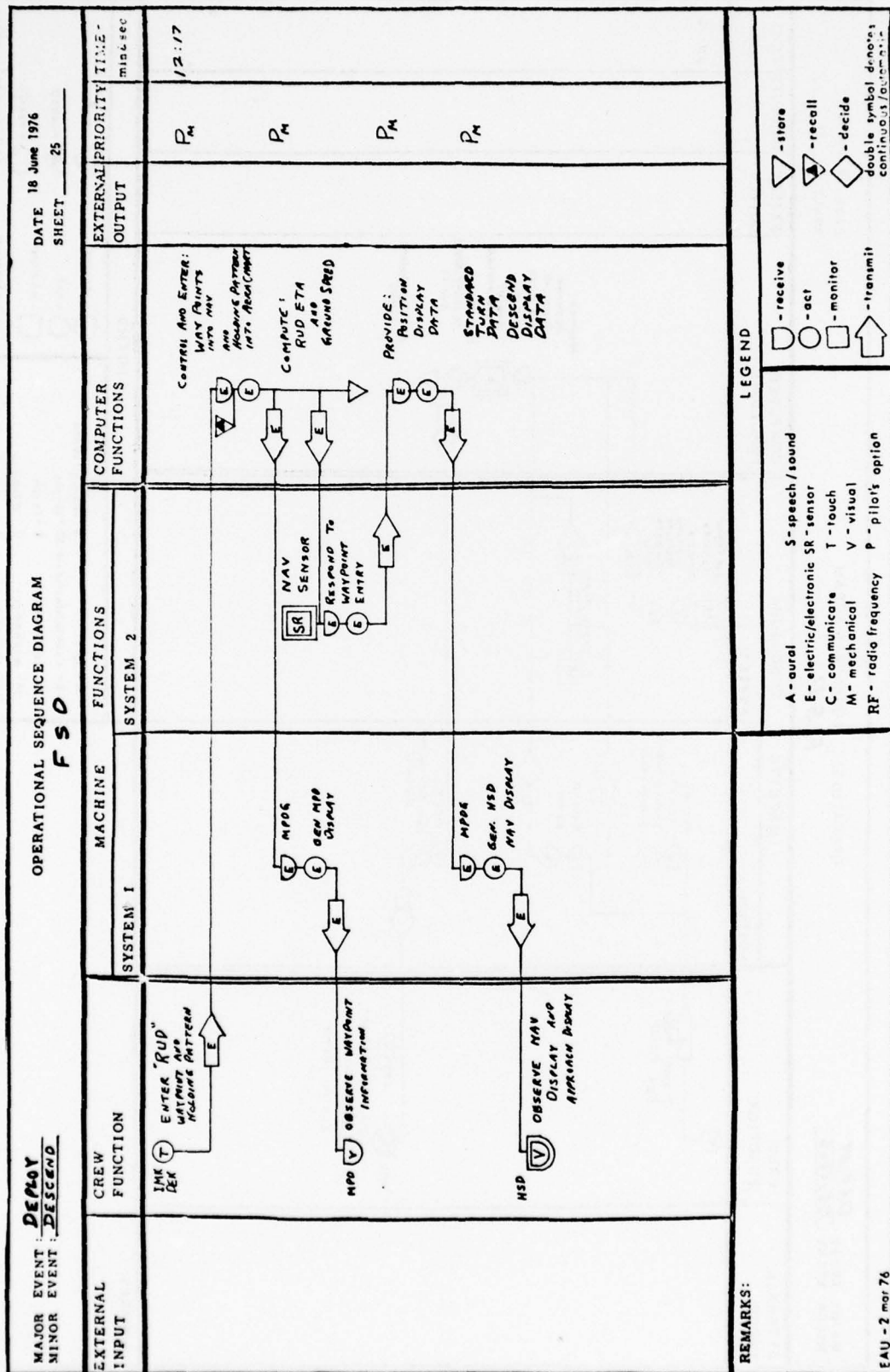
REMARKS:

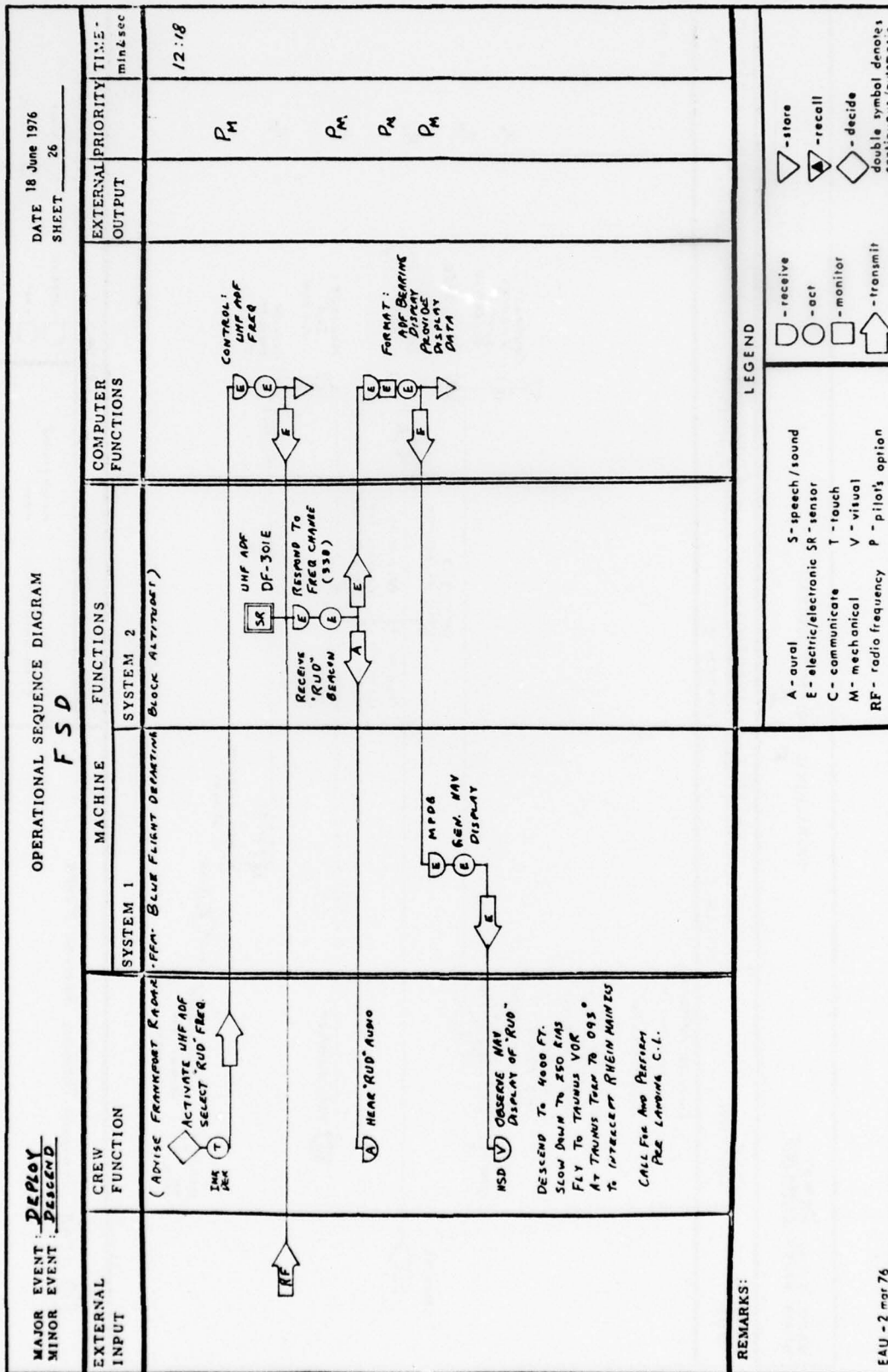
LEGEND

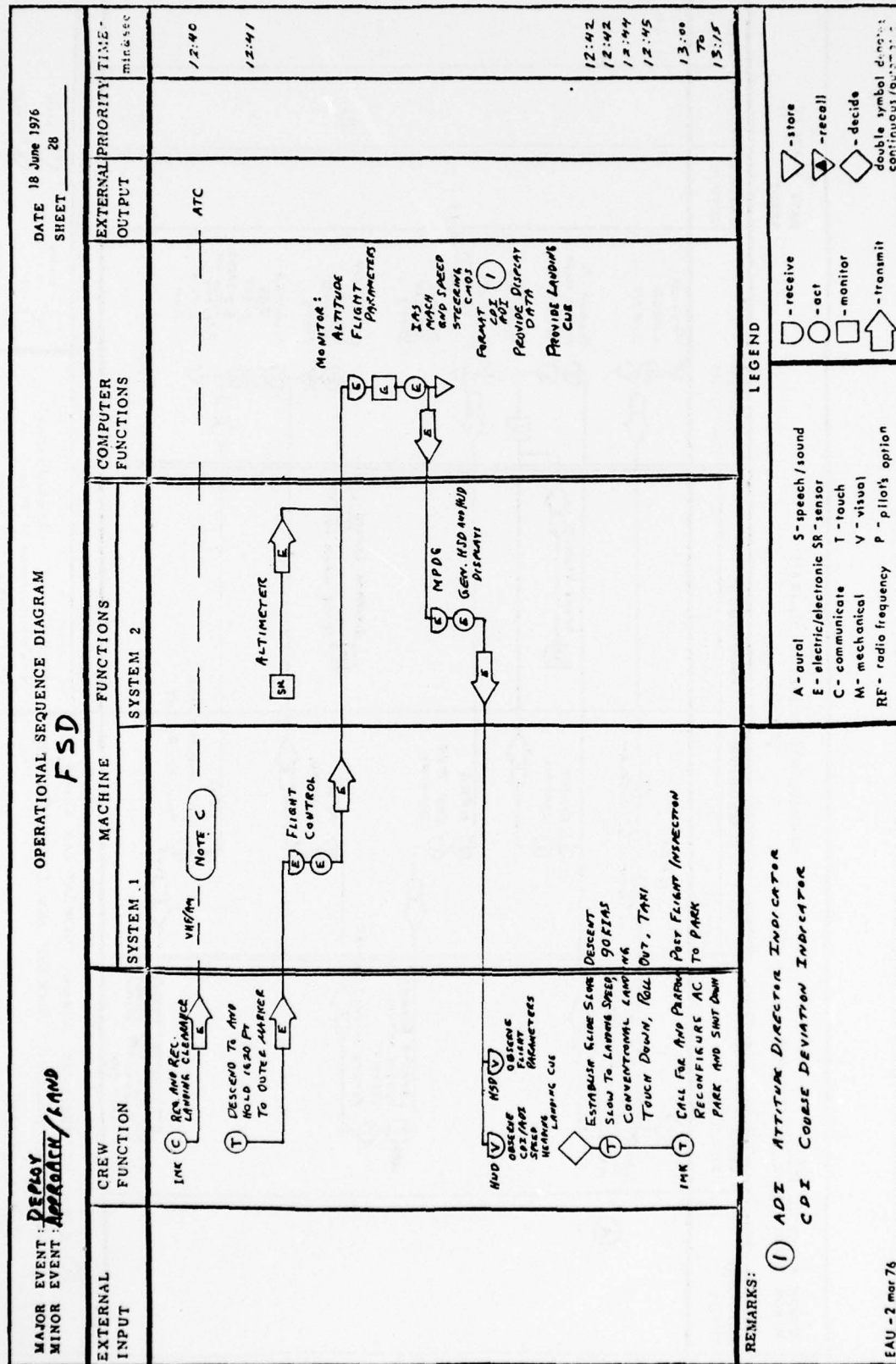
- | | | |
|-------------------------|--------------------|----------------------------------|
| A - aural | S - speech / sound | ▷ - receive |
| E - electric/electronic | SR - sensor | ○ - act |
| C - communicate | T - touch | ◻ - monitor |
| M - mechanical | V - visual | ◊ - decide |
| RF - radio frequency | P - pilot's option | double symbol driving continuous |

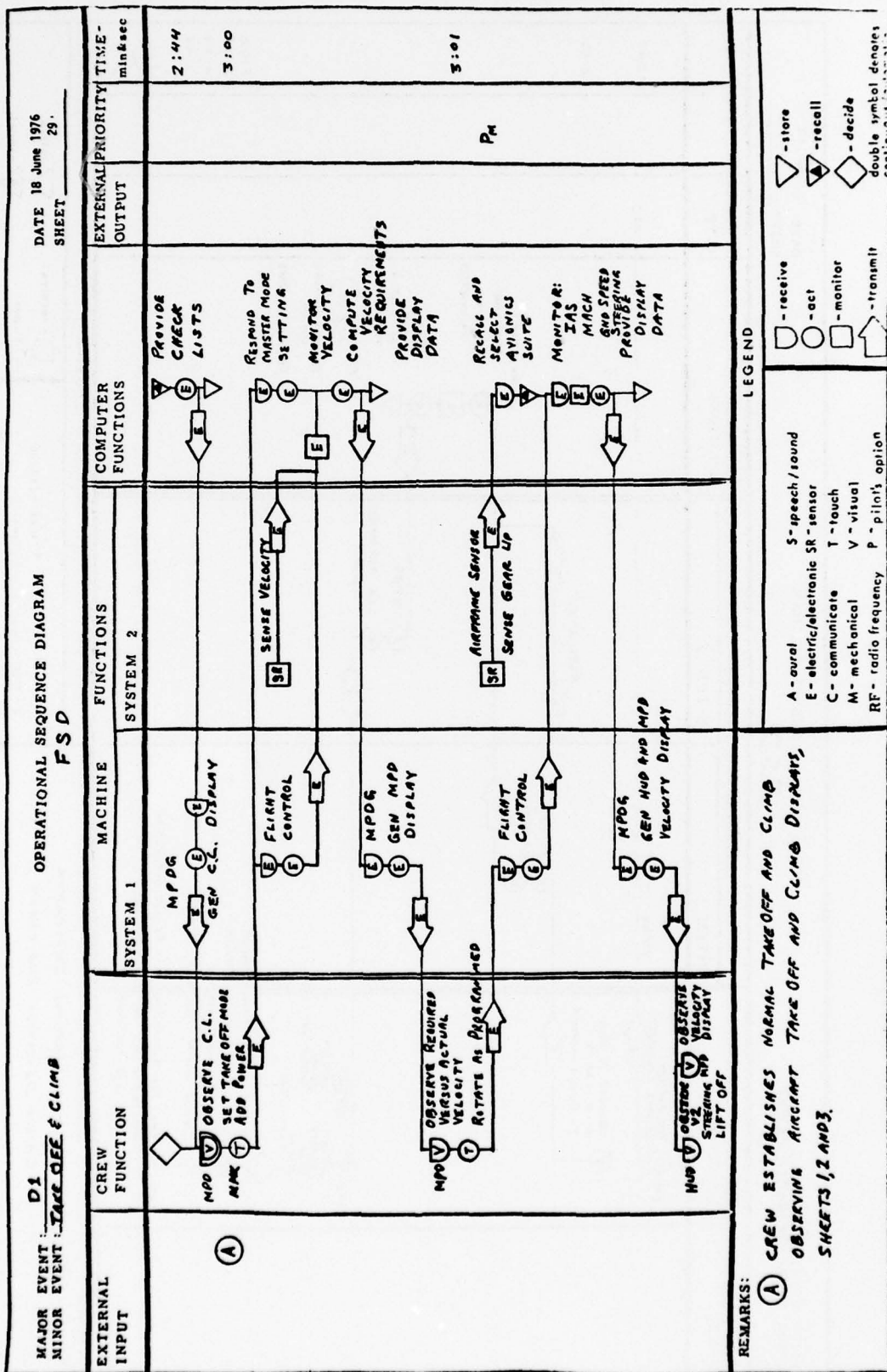
EAU - 2 - mar 76











MAJOR EVENT: DL

MINOR EVENT: TO CLIMB

OPERATIONAL SEQUENCE DIAGRAM

F 3 D

DATE: 18 June 1976

SHEET: 30

EXTERNAL INPUT	CREW FUNCTION	MACHINE FUNCTIONS	FUNCTIONS	COMPUTER FUNCTIONS	EXTERNAL PRIORITY OUTPUT	TIME min:sec
		SYSTEM 1	SYSTEM 2			
	<p>MPD</p> <p>RETRACT GEAR RESET FLAPS PERFORM CLIMB CL GET CLIMB MODE</p> <p>◇ (T)</p>	<p>RETRACT GEAR</p> <p>RETRACT FLAPS</p> <p>SENSE AIRCRAFT PITCH AOA BANK YAW</p> <p>SENSE FLAPS RETRACTED</p> <p>MPDQ</p> <p>GENERATE AIRCRAFT TD, AOA CLIMB DISPLAYS</p>	<p>SENSE ALTITUDE</p> <p>SENSE PRESSURIZATION</p> <p>SENSE GEAR UP</p> <p>SENSE FLAPS RETRACTED</p>	<p>MONITOR:</p> <p>PRESSURE GEAR FLAPS SPEED BRAKES ALTITUDE HEADING PITCH BANK YAW</p> <p>ANGLE OF ATTACK SELECT AVIATION SUITS</p> <p>FORMAT CURRENT PARAMETERS</p> <p>PROVIDE DISPLAY DATA</p>	PH	3:02
	<p>MPD</p> <p>OBSEVCE AIRCRAFT TD, AOA CLIMB DISPLAYS</p> <p>▽ (T)</p>					

LEGEND

A - aural

E - electric/electronic

C - communicate

M - mechanical

RF - radio frequency

S - speech / sound

SR - sensor

T - touch

V - visual

P - pilot's option

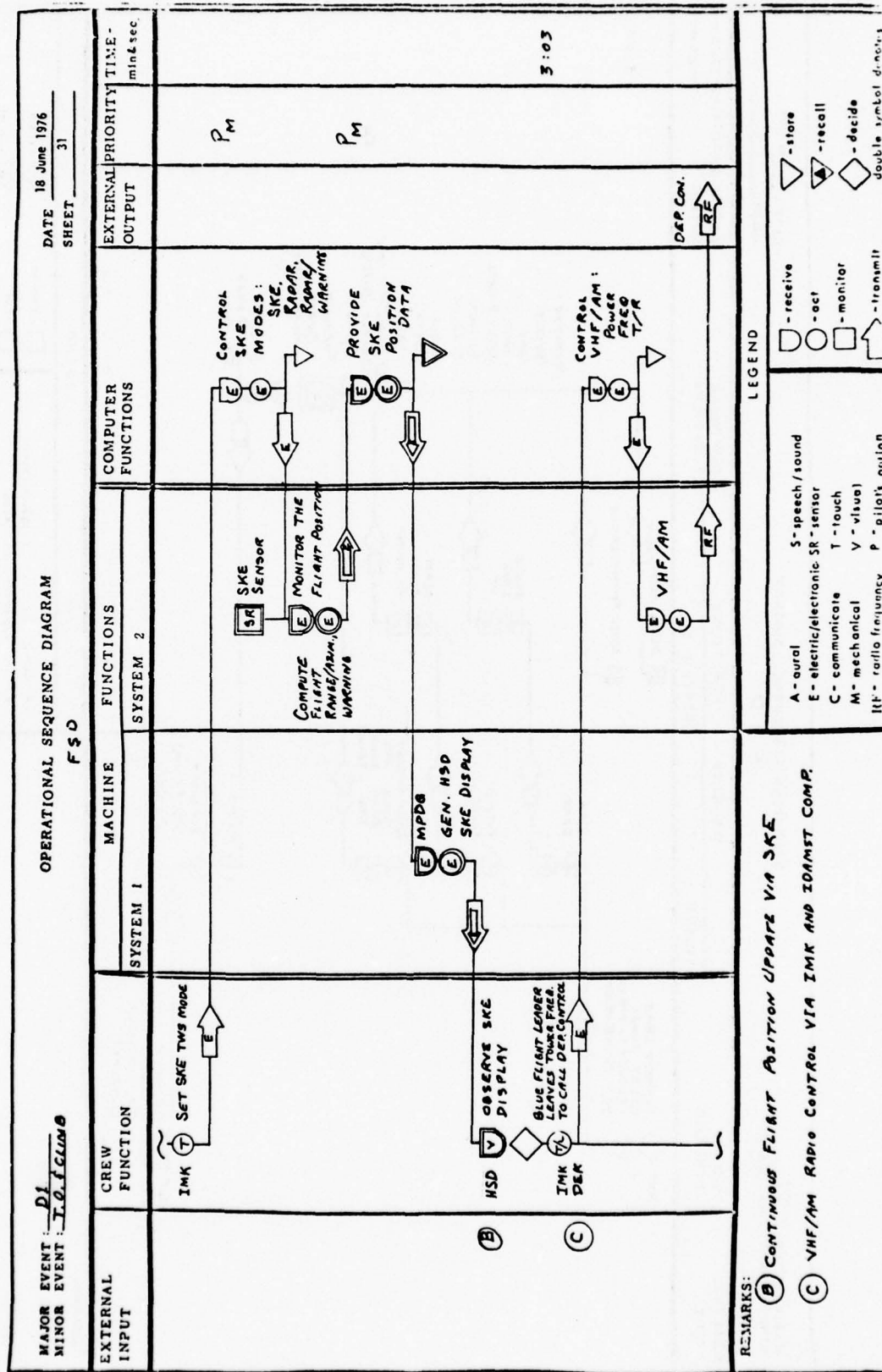
◇ - store

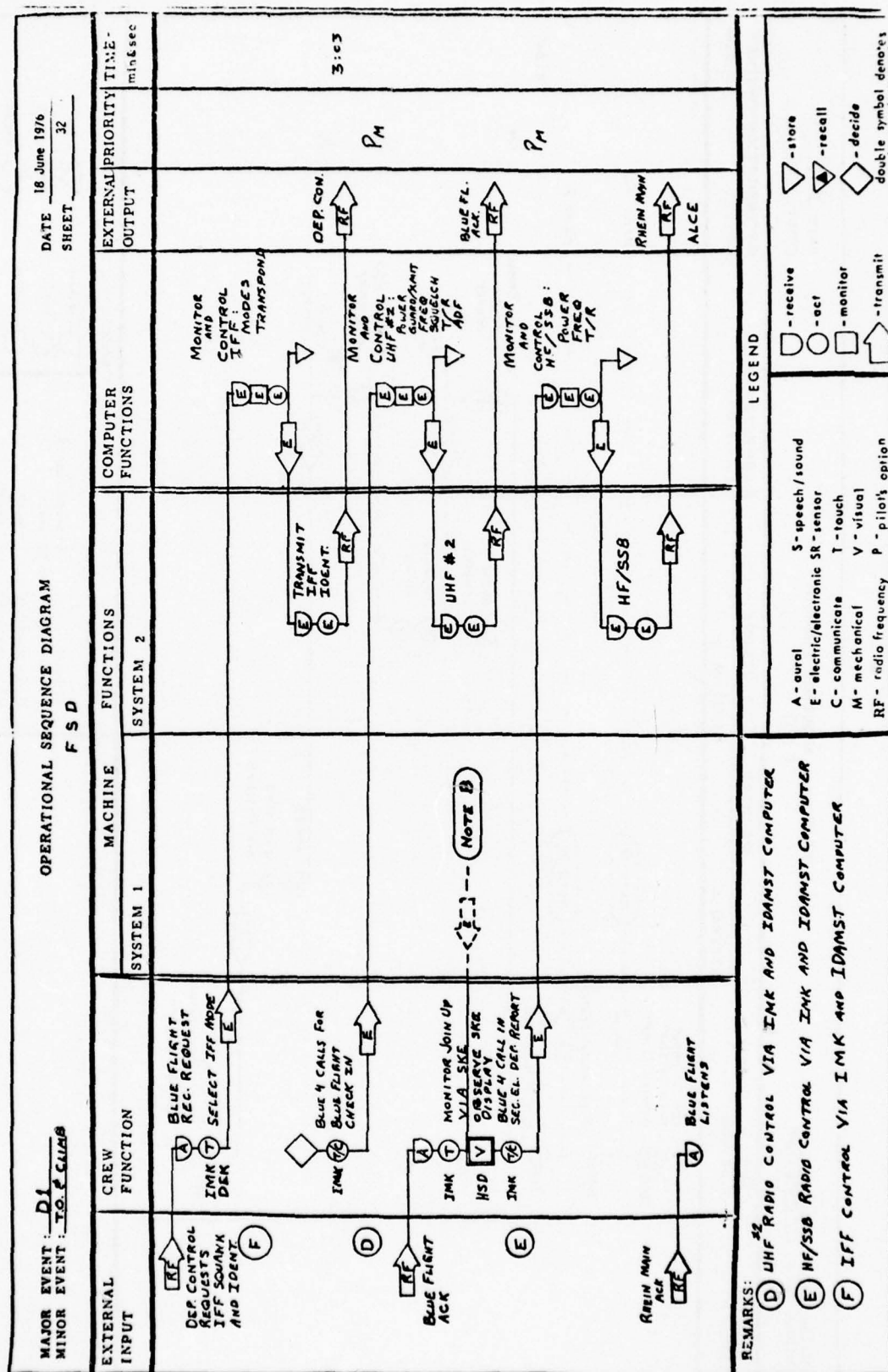
◇ (filled) - recall

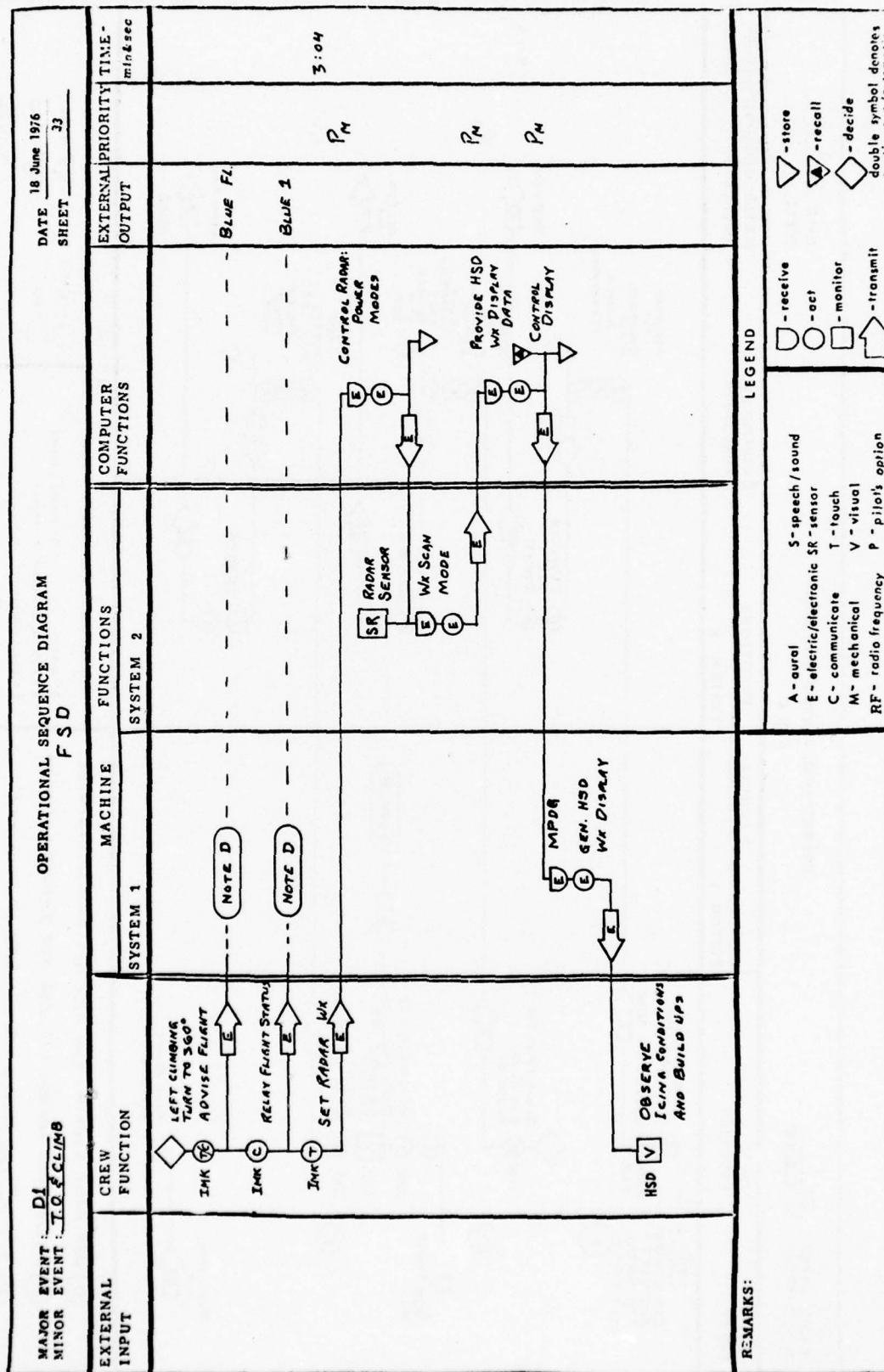
◇ (double) - decide

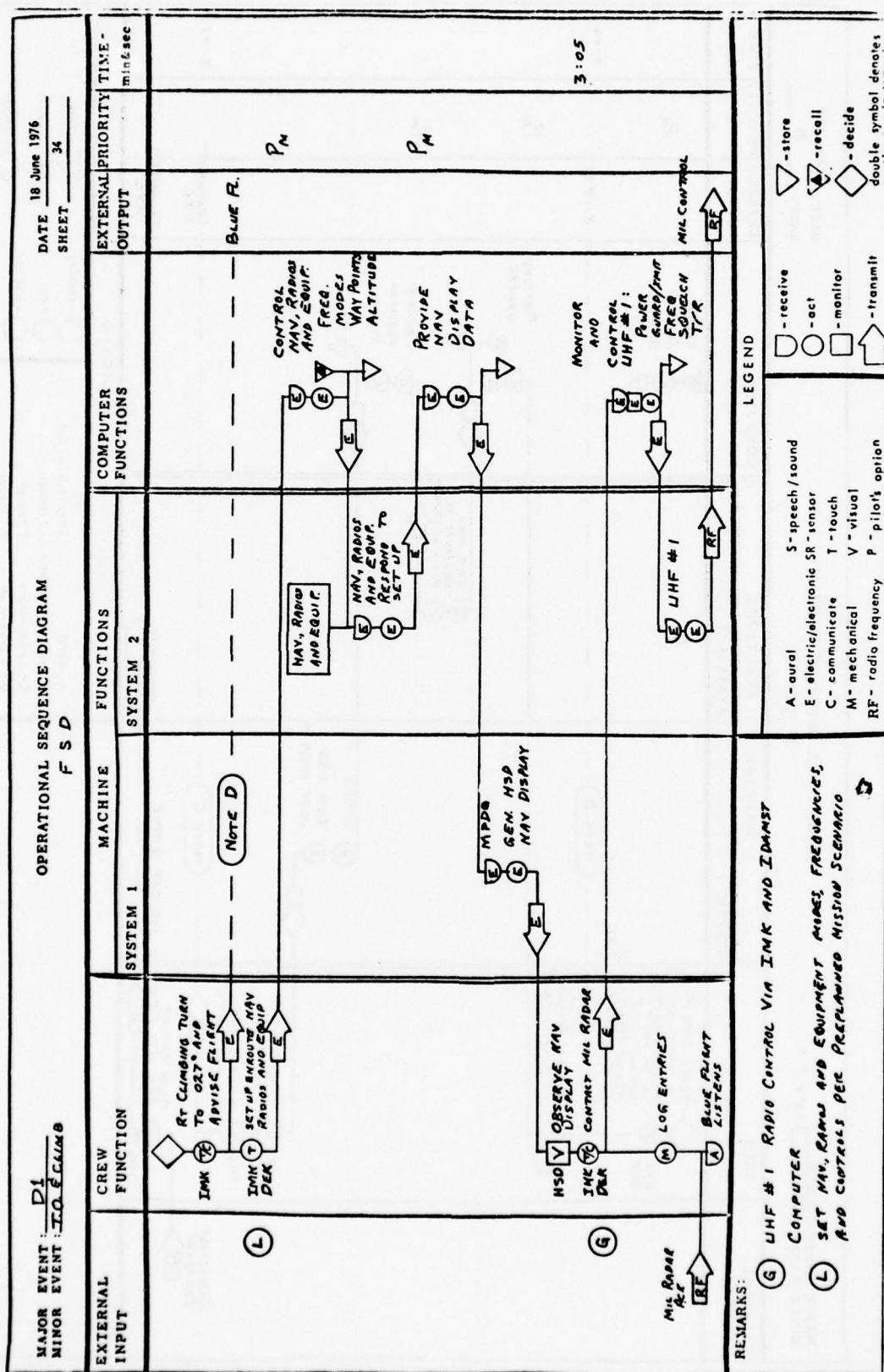
↑ - transmit

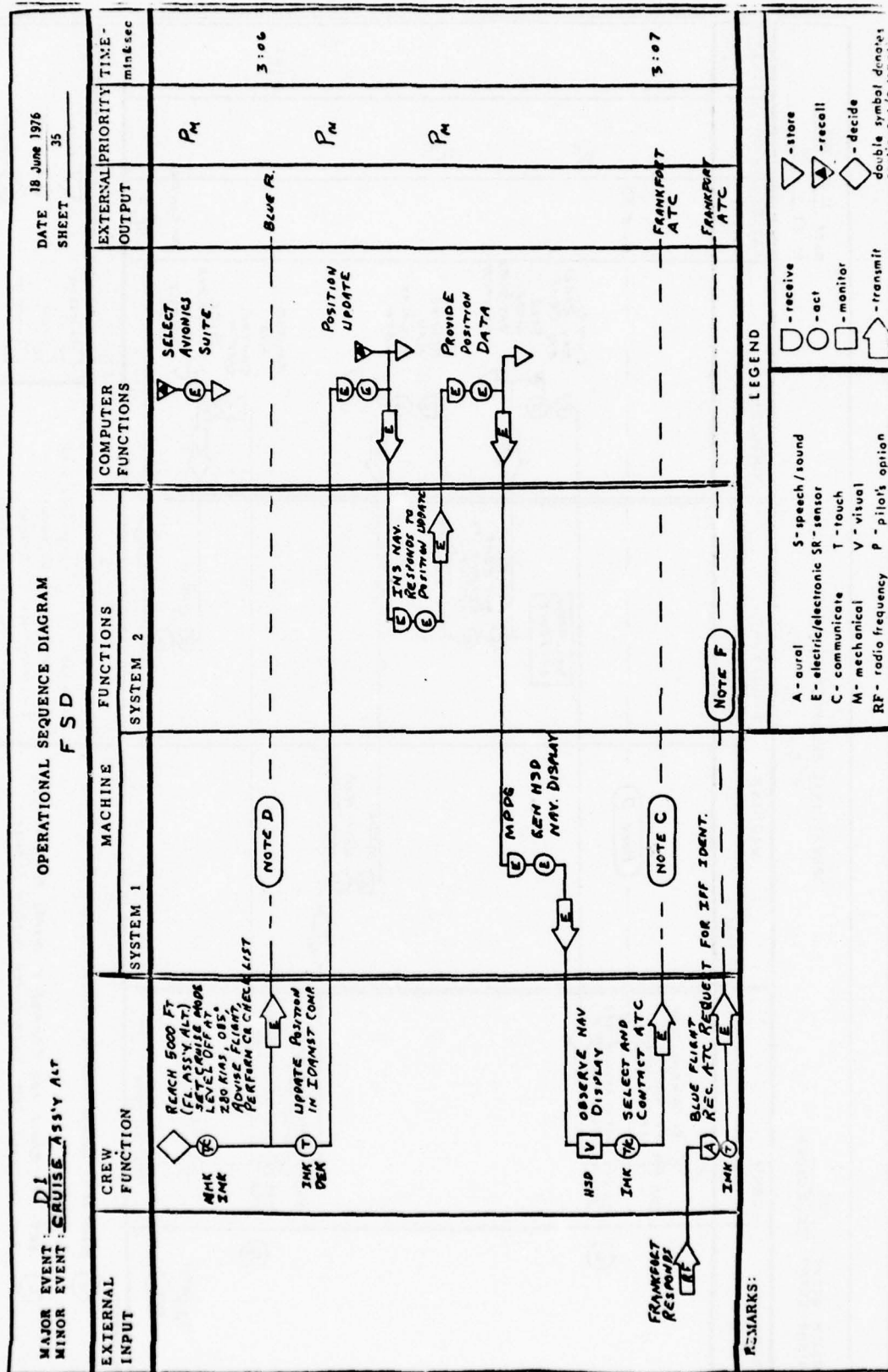
REMARKS:

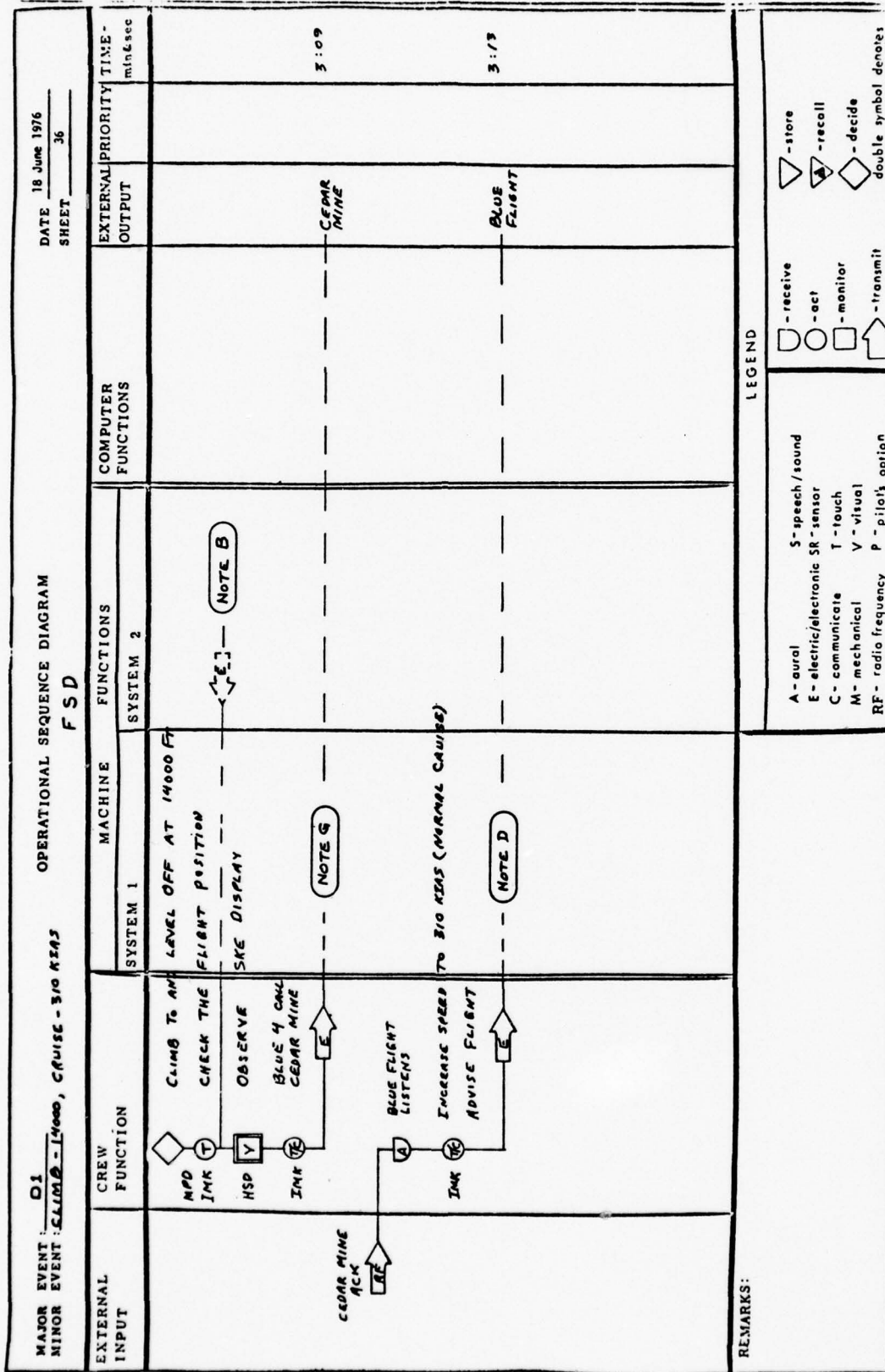


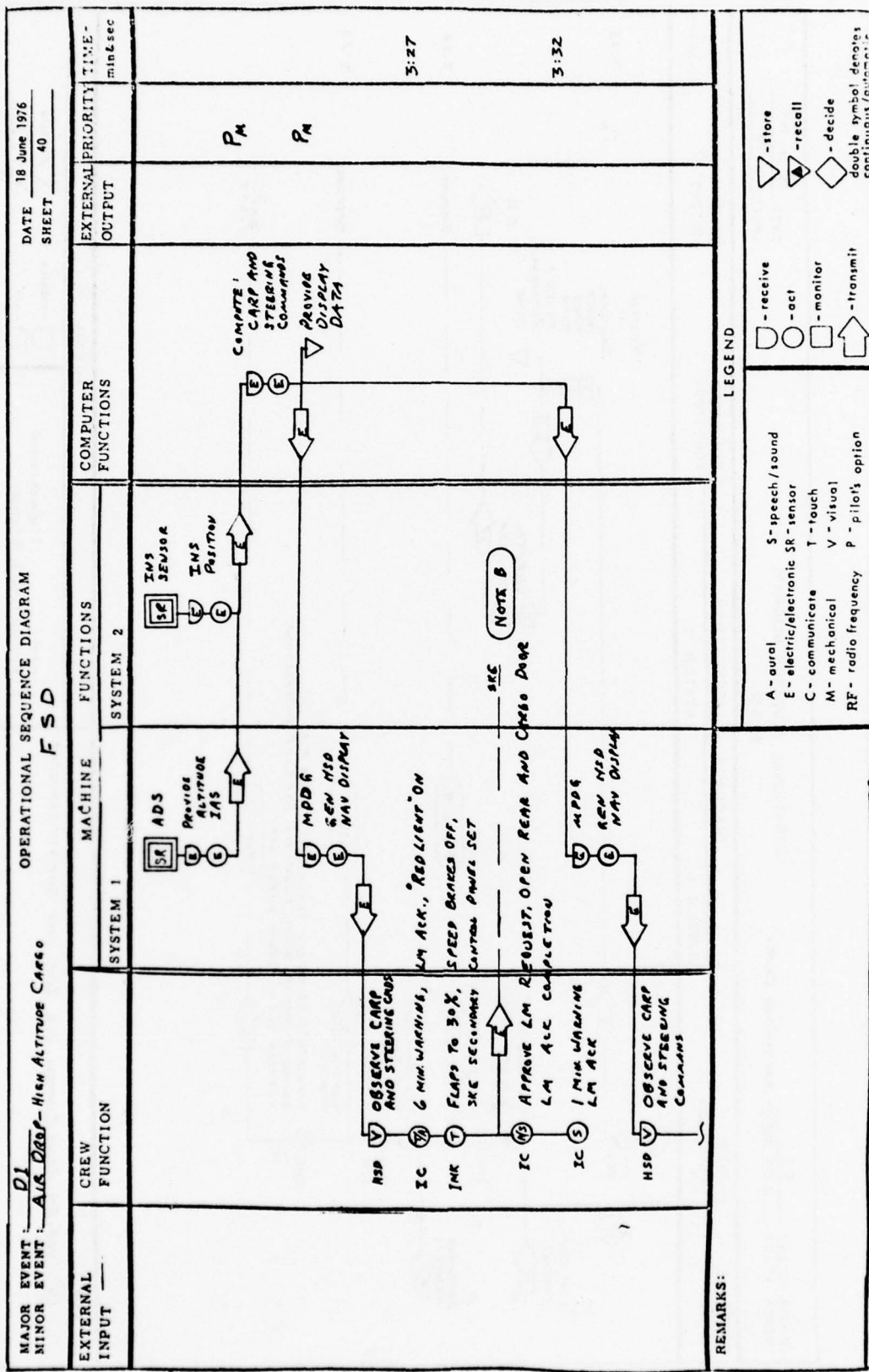


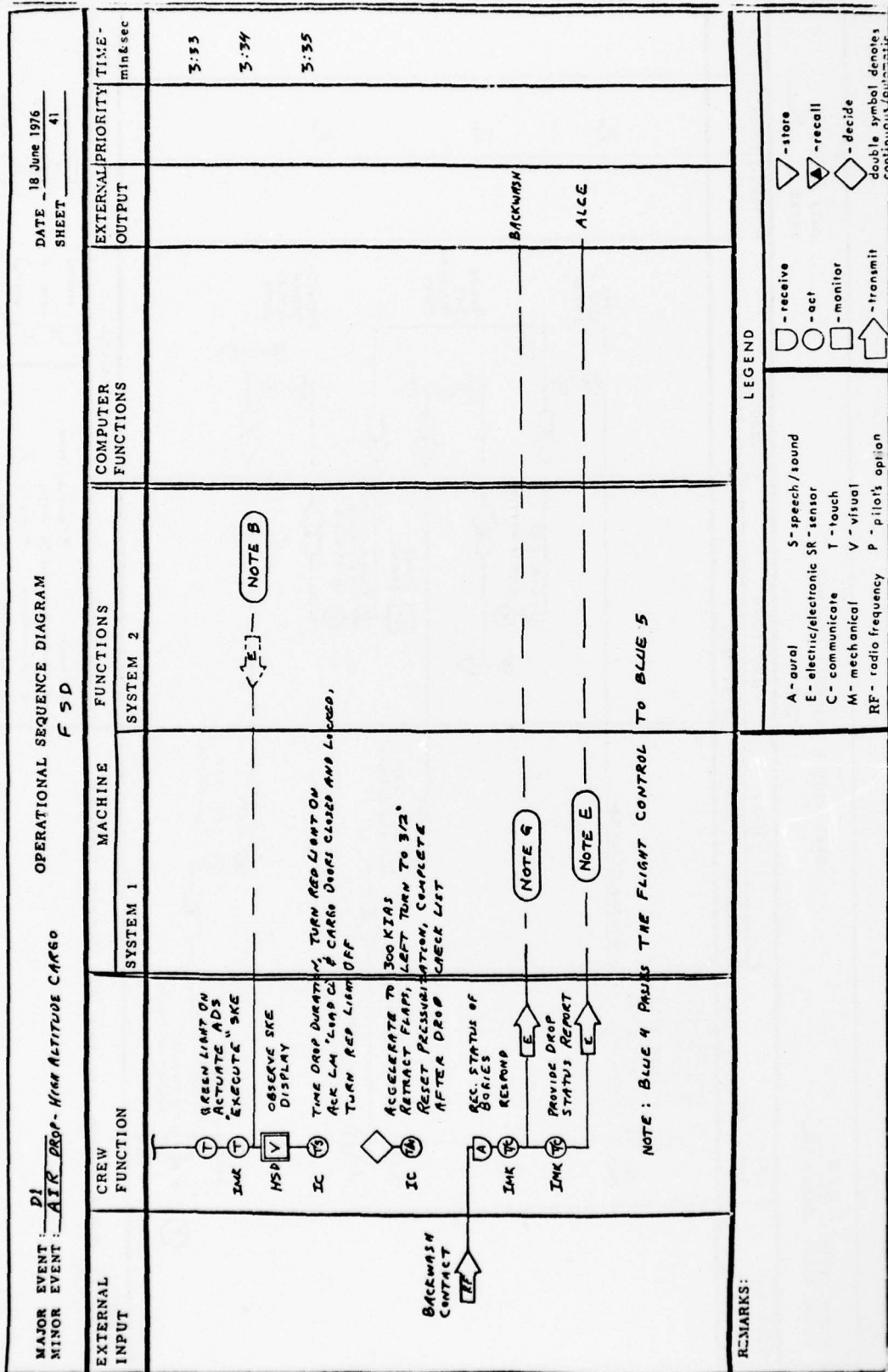


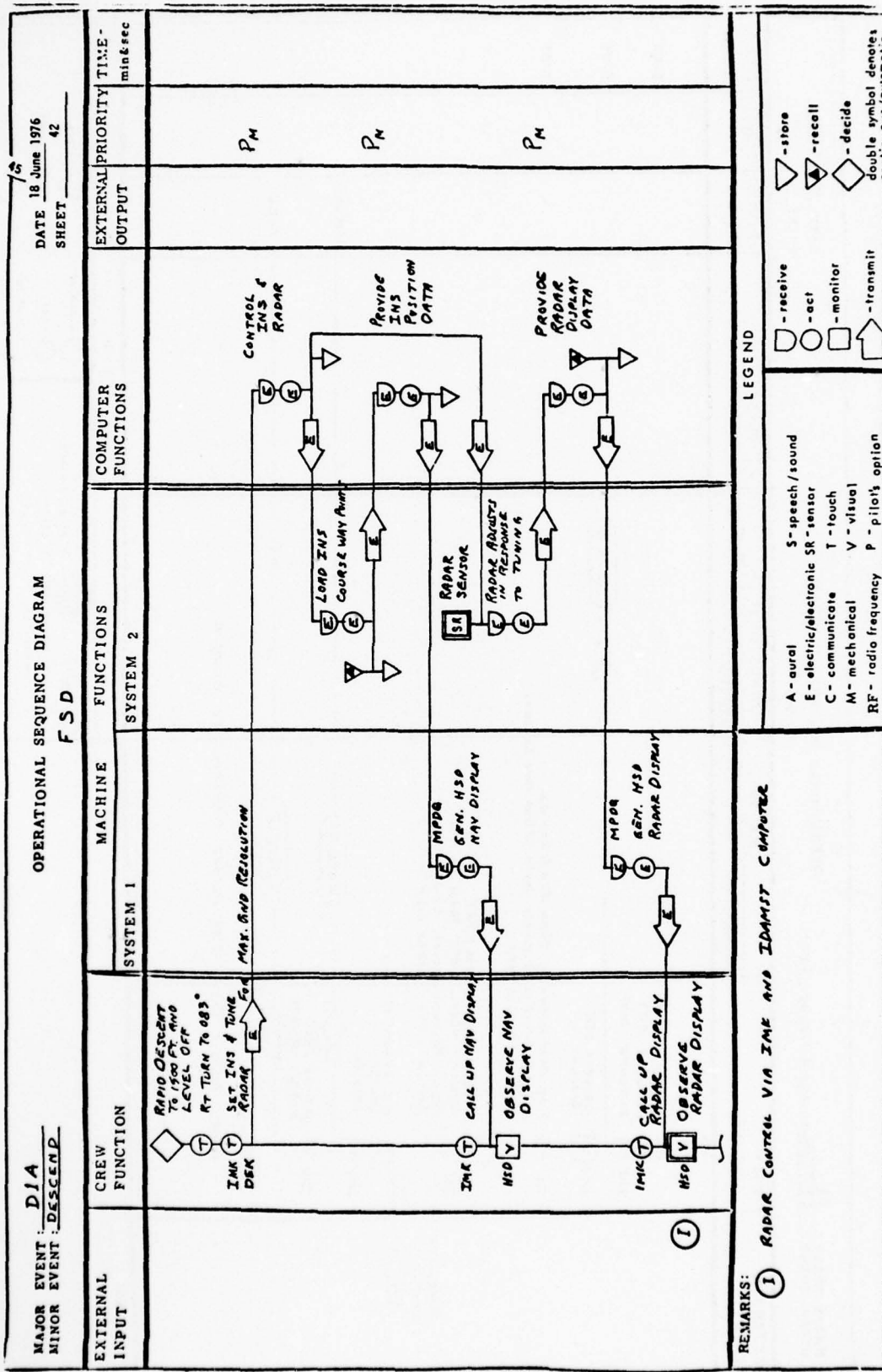


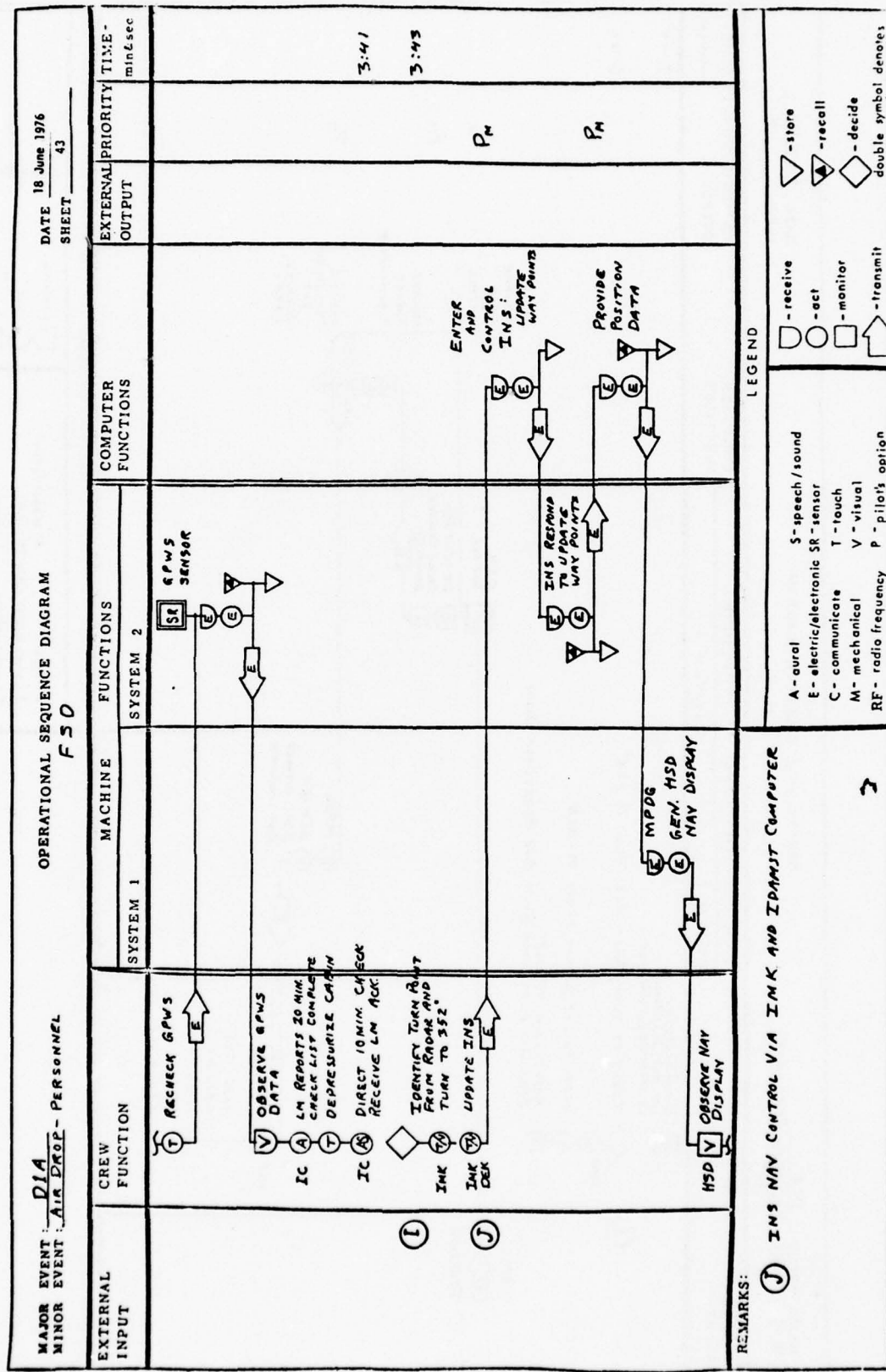












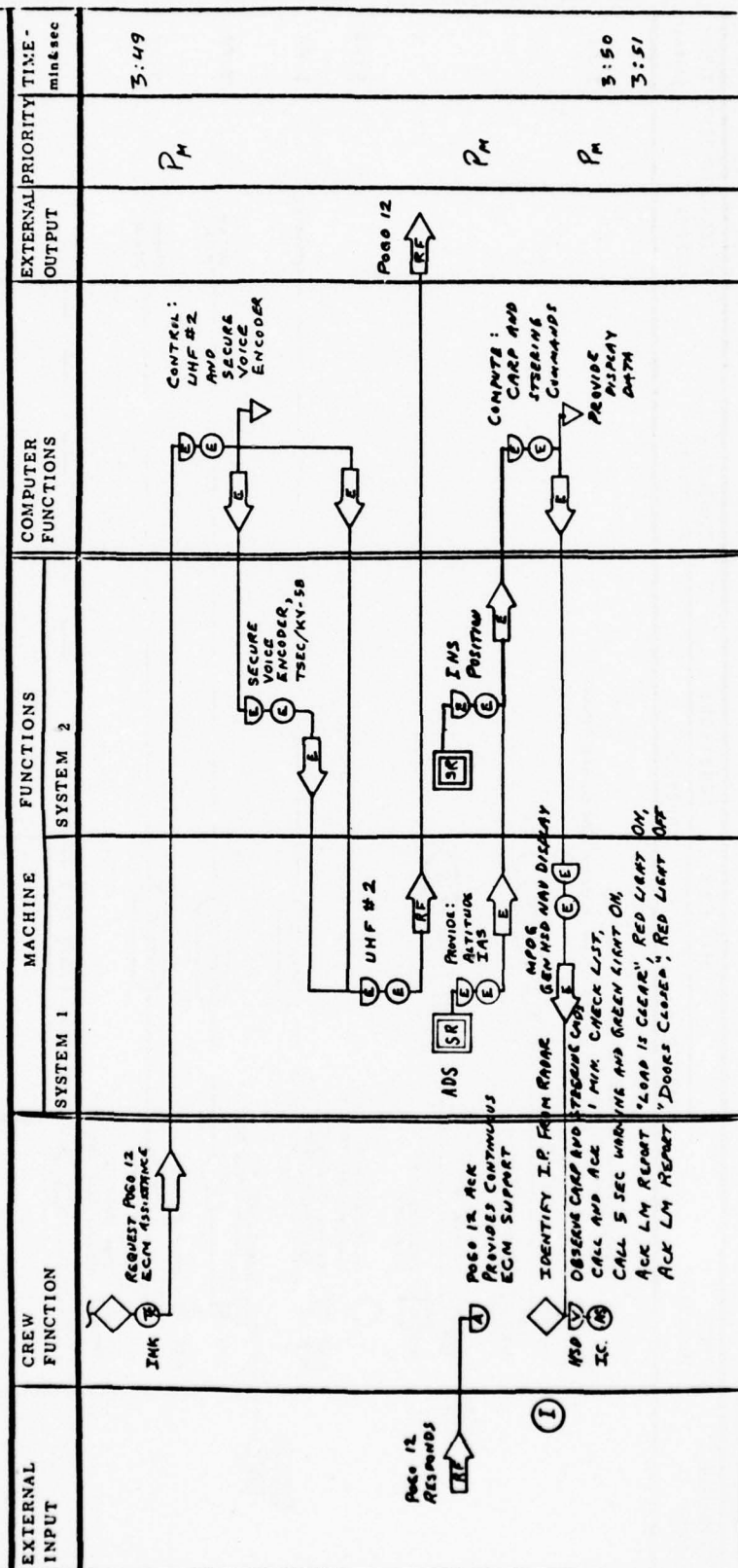
EXTERNAL INPUT	CREW FUNCTION	MACHINE	FUNCTIONS		COMPUTER FUNCTIONS	EXTERNAL PRIORITY OUTPUT	TIME - min & sec
			SYSTEM 1	SYSTEM 2			
(I)	<p>6 MIN. WARNING LM ACK, REPLICATION CV MEASURE FALTIMETER</p> <p>MPD (T) (A)</p> <p>IC</p>	<p>IDENTIFY TURN POINT AND TURN TO 322°</p> <p>SPEED BRACES ON AND FLAPS TO 50%</p> <p>APPROVE LM REQUEST OPEN AIR DEFLECTOR DUES AND PARATROOP DUES</p>	<p>ESM SENSOR</p> <p>DETECT SAM</p> <p>RANGE TRACKER</p> <p>STARTING</p>	<p>MONITOR AND CONTROL ESM</p> <p>MONITOR THREAT IDENTIFICATION</p> <p>PROVIDE ESM DISPLAY AND WARNING DATA</p>	P4 P4 P4	<p>3:44</p> <p>3:46</p>	
SAM TRACKING	<p>HSD V MD U V A</p> <p>HEAR AND OBSERVE WARNING OF SAM TRACKING</p>	<p>MPDR</p> <p>GEN HSD</p> <p>ESM DISPLAY AND WARNING</p>					

REMARKS:

LEGEND








A - aural S - speech / sound
 E - electric/electronic SR - sensor
 C - communicate T - touch
 M - mechanical V - visual
 RF - radio frequency P - pilot's action

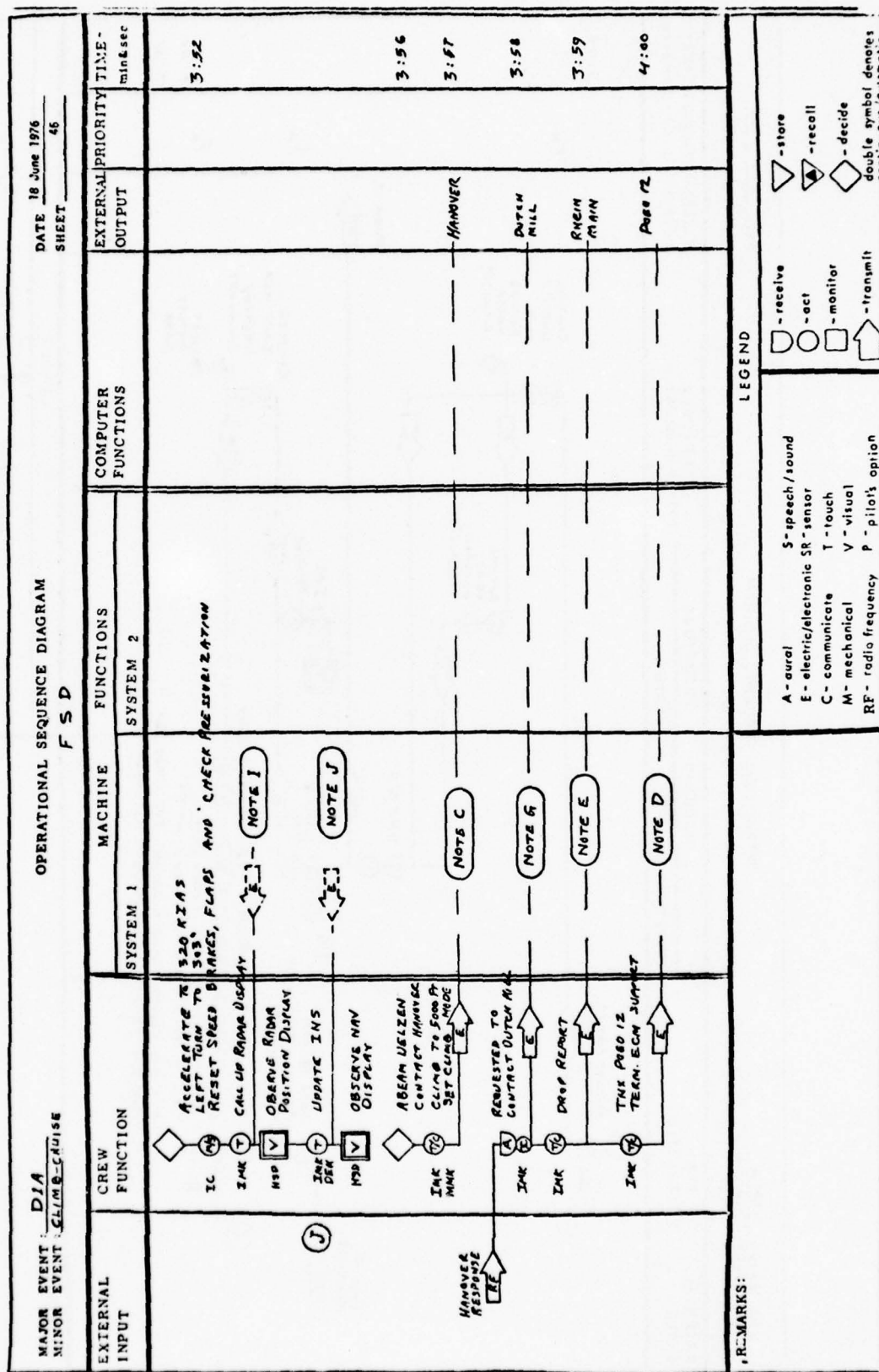
- store
 - recall
 - decide
 double symbol denotes

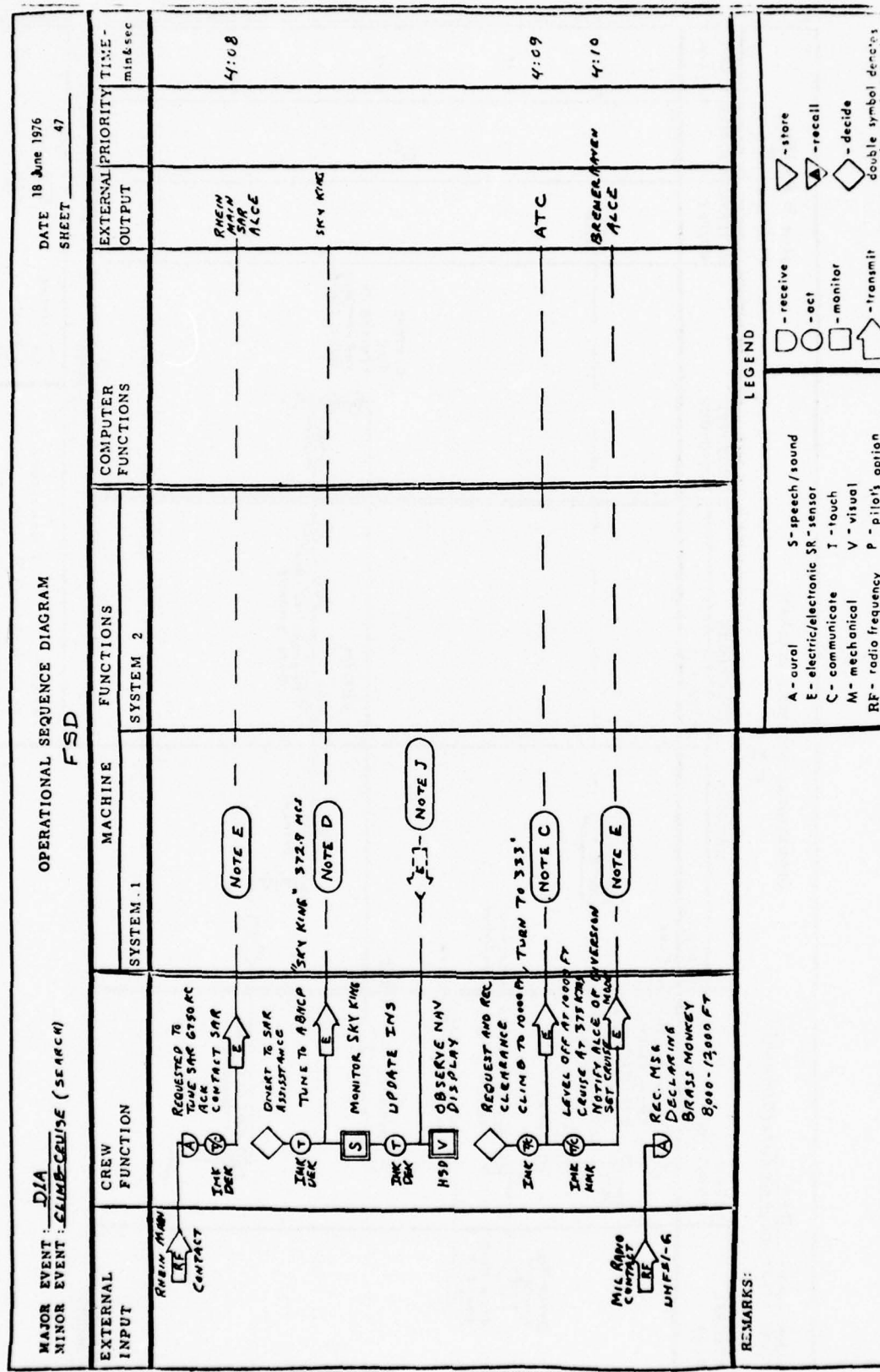


REMARKS:

LEGEND

A - aural	S - speech / sound		- receive		- store
E - electric / electronic	SR - sensor		- act		- recall
C - communicate	T - touch		- monitor		- decide
M - mechanical	V - visual		- transmit		double symbol denotes
RF - radio frequency	P - pilot's option				





MAJOR EVENT: DIA
MINOR EVENT: ELIMB-CRUISE (SEARCH)

OPERATIONAL SEQUENCE DIAGRAM
FSD

EXTERNAL INPUT	CREW FUNCTION	MACHINE	FUNCTIONS	COMPUTER FUNCTIONS	EXTERNAL OUTPUT	PRIORITY	TIME - min:sec
		SYSTEM 1	SYSTEM 2				
	IDENTIFY BUFFER ZONE FROM COMPASS AND POSITION AND POSITION SELECT IFF MODE	NOTE F					4:11
	TURN TO 240° TURN TO 333°						4:11
DUTCH NUL CONTACT	ACK SPLASHDOWN MESSAGE CONFIRM LAT/LONG. POSITION						4:12
ARMED MAIN CONTACT	ACK. MSG. HELIC. JOIN 05107 EN ROUTE						4:12
	ACTIVATE HOME MODE						4:17
	OBSERVE HOME DISPLAY						4:17

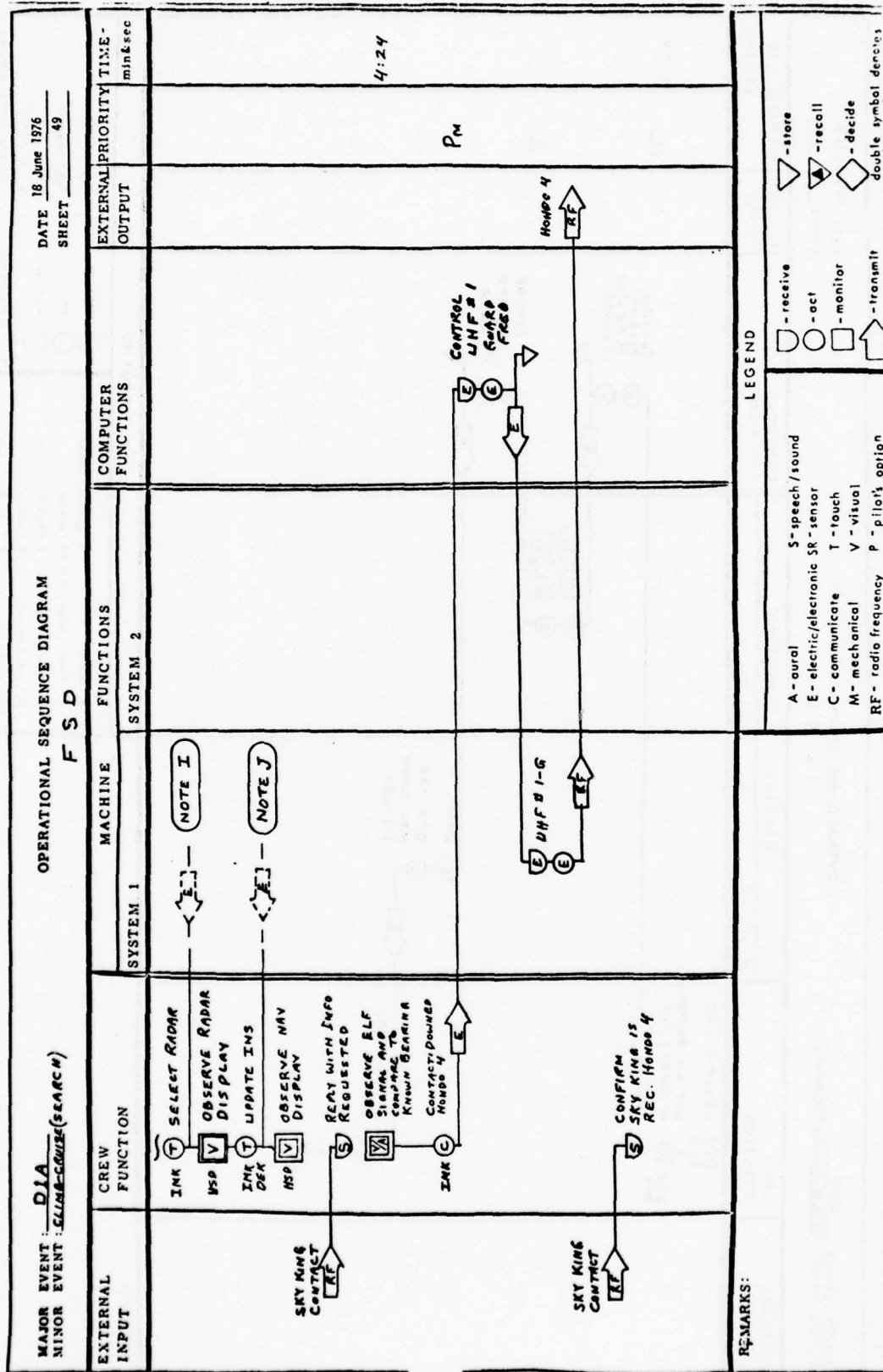
LEGEND

A - aural
E - electric/electronic SR - sensor
C - communicate
M - mechanical
RF - radio frequency
P - pilot's option

S - speech / sound
T - touch
V - visual

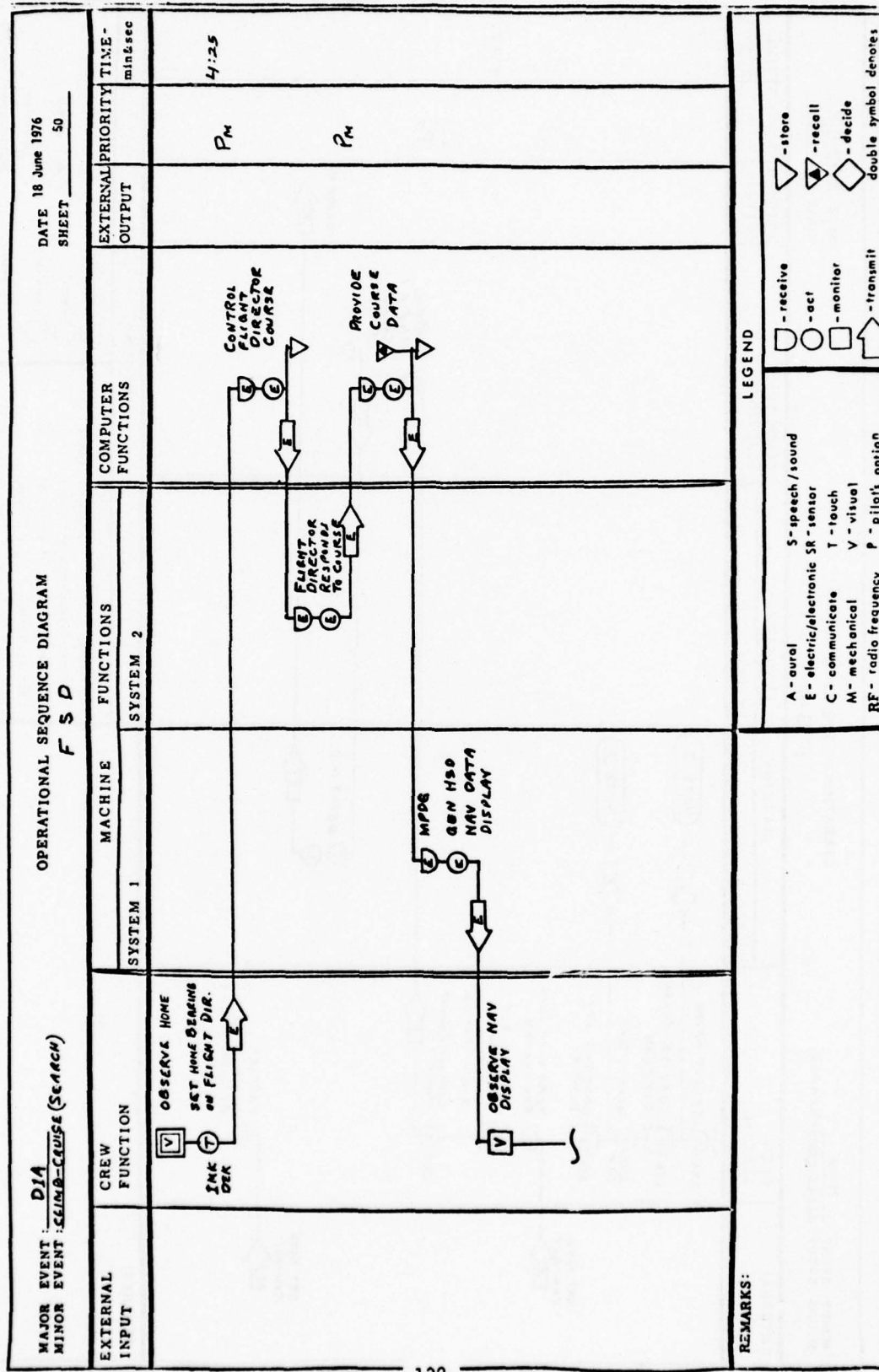
△ - store
△ - recall
◇ - decide
double symbol denotes

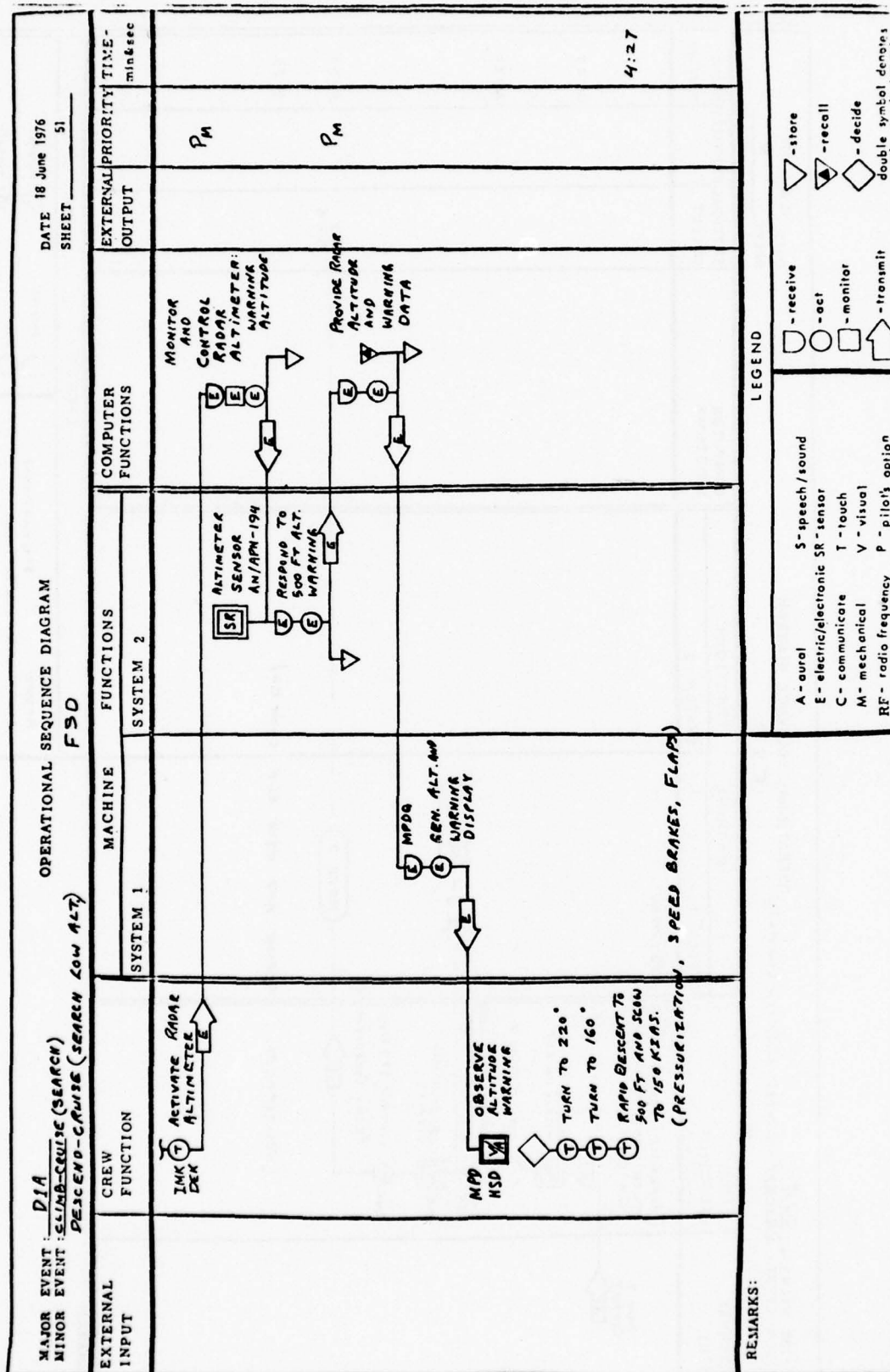
REMARKS:









LEGEND

A - aural	S - speech / sound	- store
E - electric/electronic	SR - sensor	- recall
C - communicate	T - touch	- decide
M - mechanical	V - visual	double symbol denotes continuous
RF - radio frequency	P - pilot's option	
		- receive
		- act
		- monitor
		- transmit

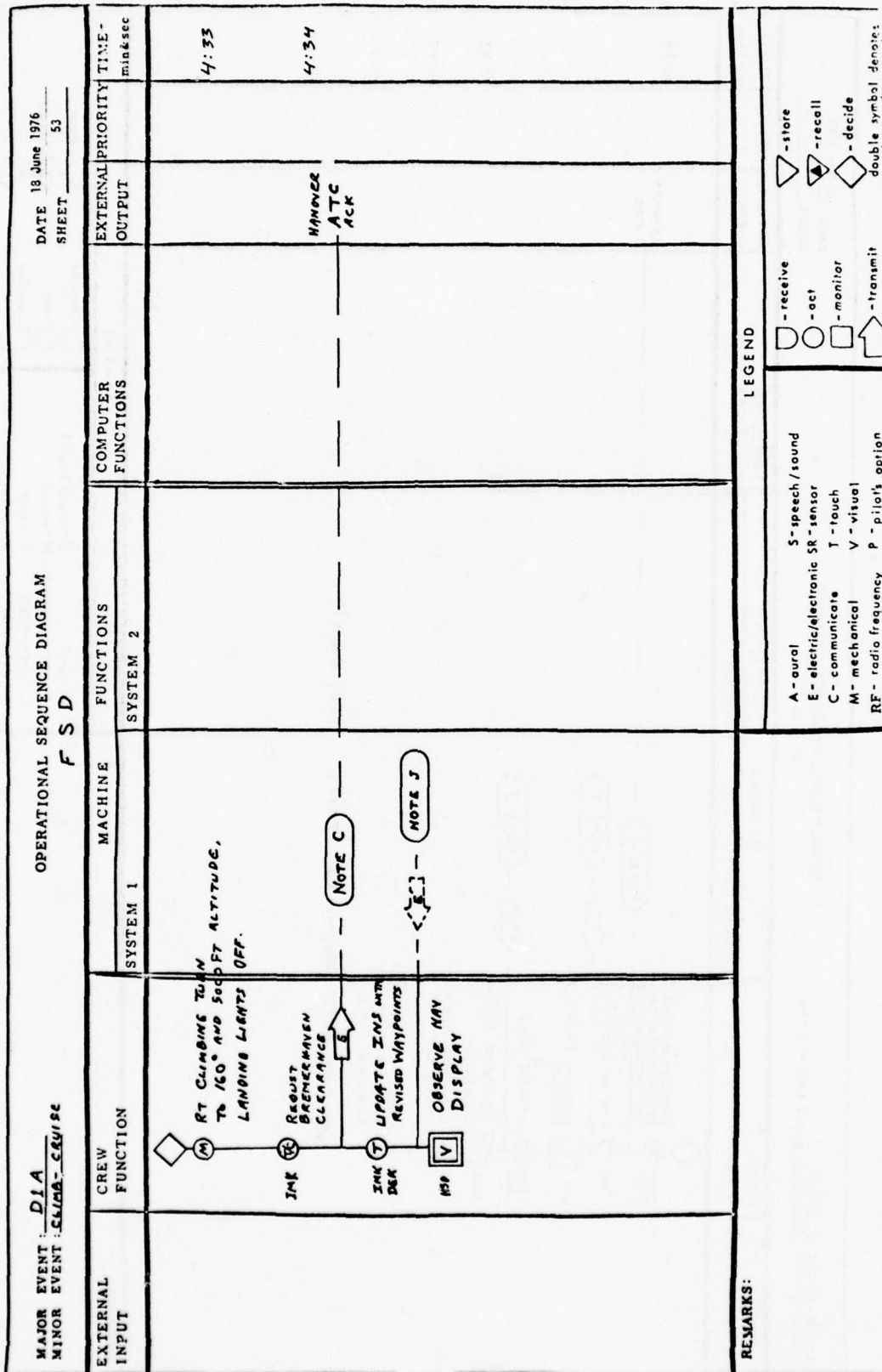


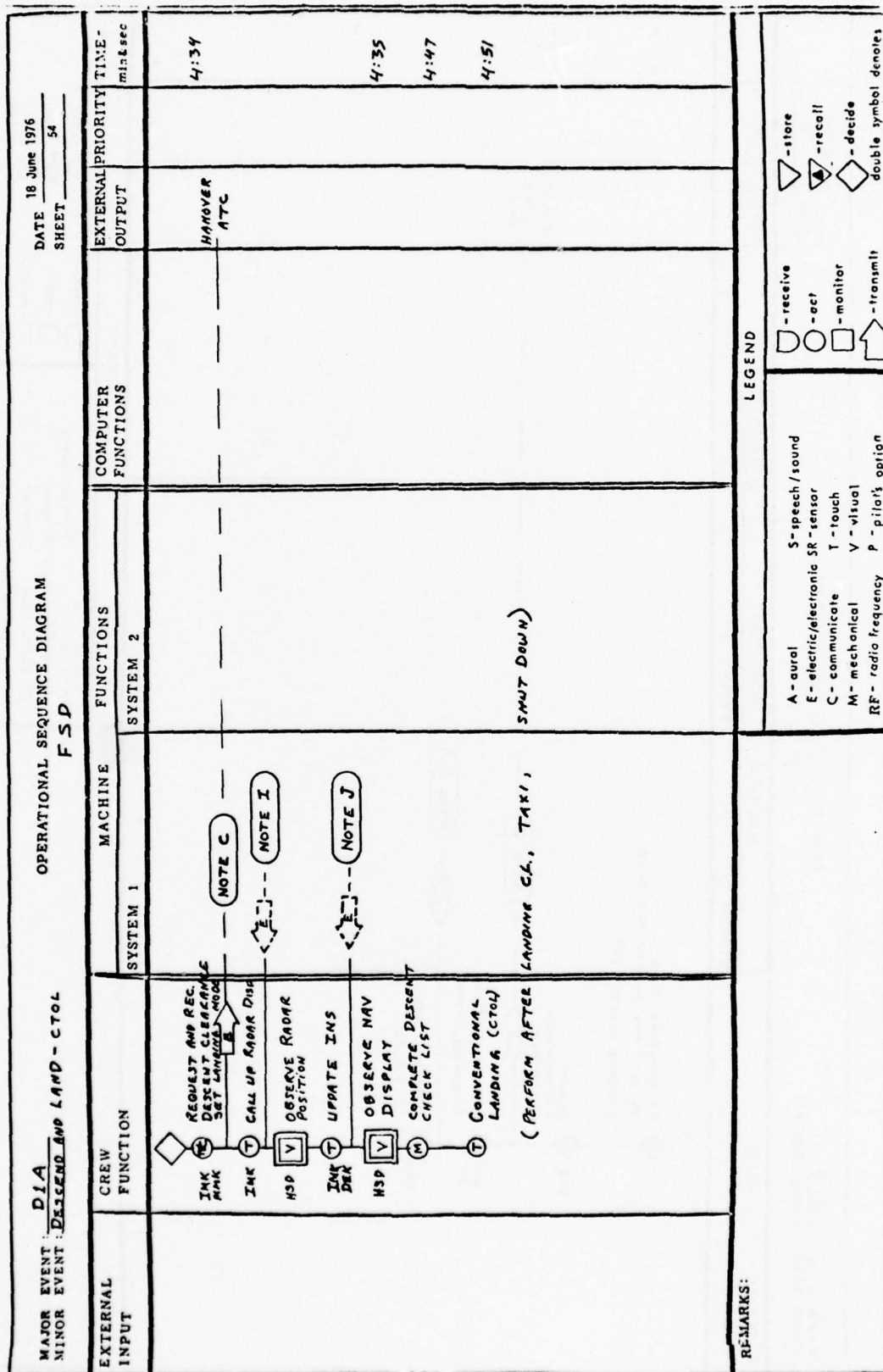


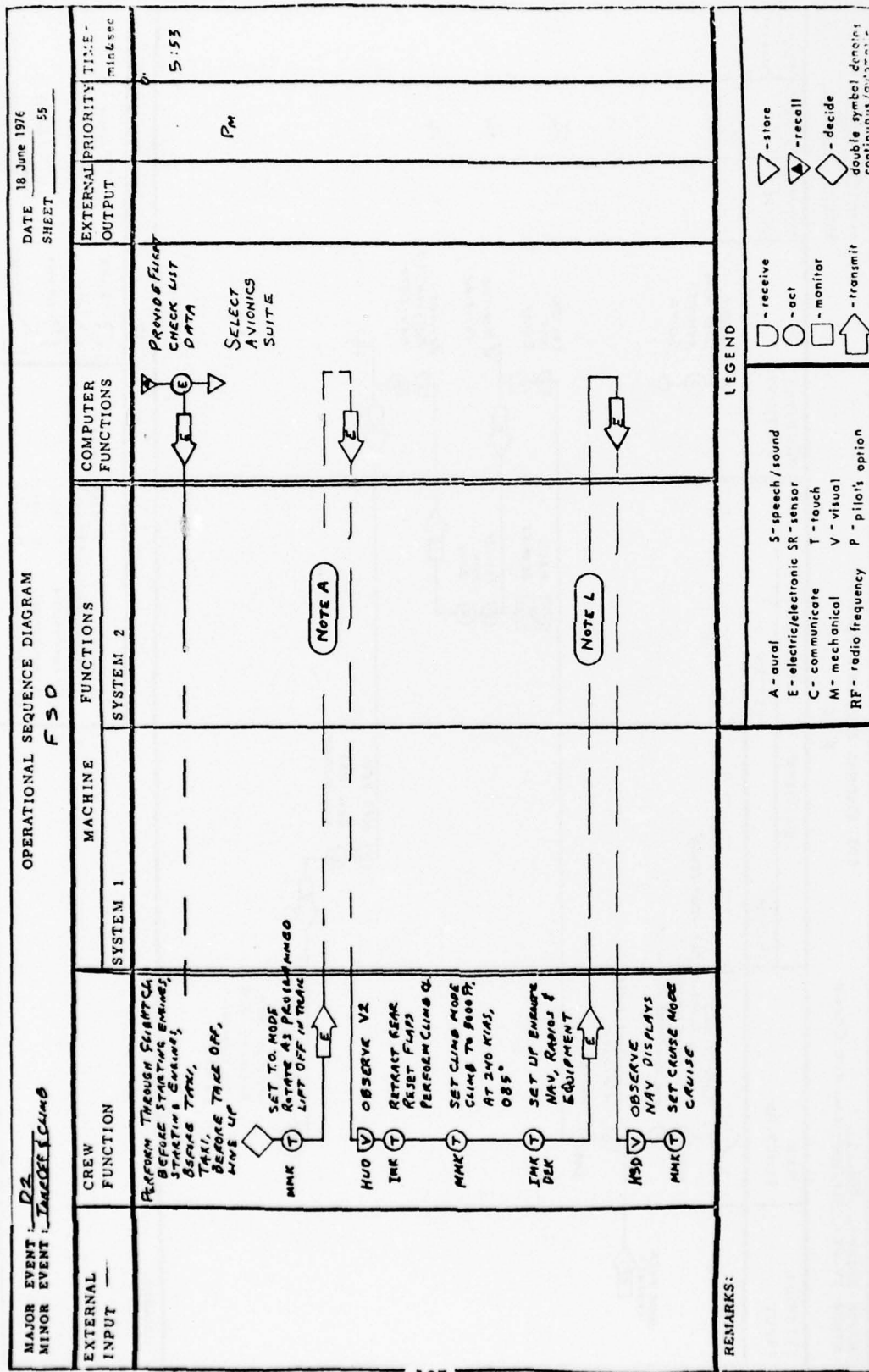
MAJOR EVENT: <u>DIA</u> MINOR EVENT: <u>DESCEND - CRUISE (SEARCH LOW ALT.)</u> OPERATIONAL SEQUENCE DIAGRAM FSD						DATE 18 June 1976	SHEET 52
EXTERNAL INPUT	CREW FUNCTION	MACHINE	FUNCTIONS	COMPUTER FUNCTIONS	EXTERNAL OUTPUT	TIME - min & sec	
		SYSTEM 1	SYSTEM 2				
Hondo 4 CONTACT 	(APPROACH DOWNED PILOT TURN LANDING LIGHTS ON LM OBSERVE FLARE) REC. Hondo 4 MIA.  OBSERVE STATION PASSAGE ON ELF CIRCLE Hondo 4  UPDATE INS WITH Hondo 4 POSITION  OBSERVE NAV DISPLAY  CONTACT SKYKRA RELAY COORDINATES 	POSITION [E] - [NOTE J]				4:27	
						4:30	
					SKY KRA	4:30	
						4:33	

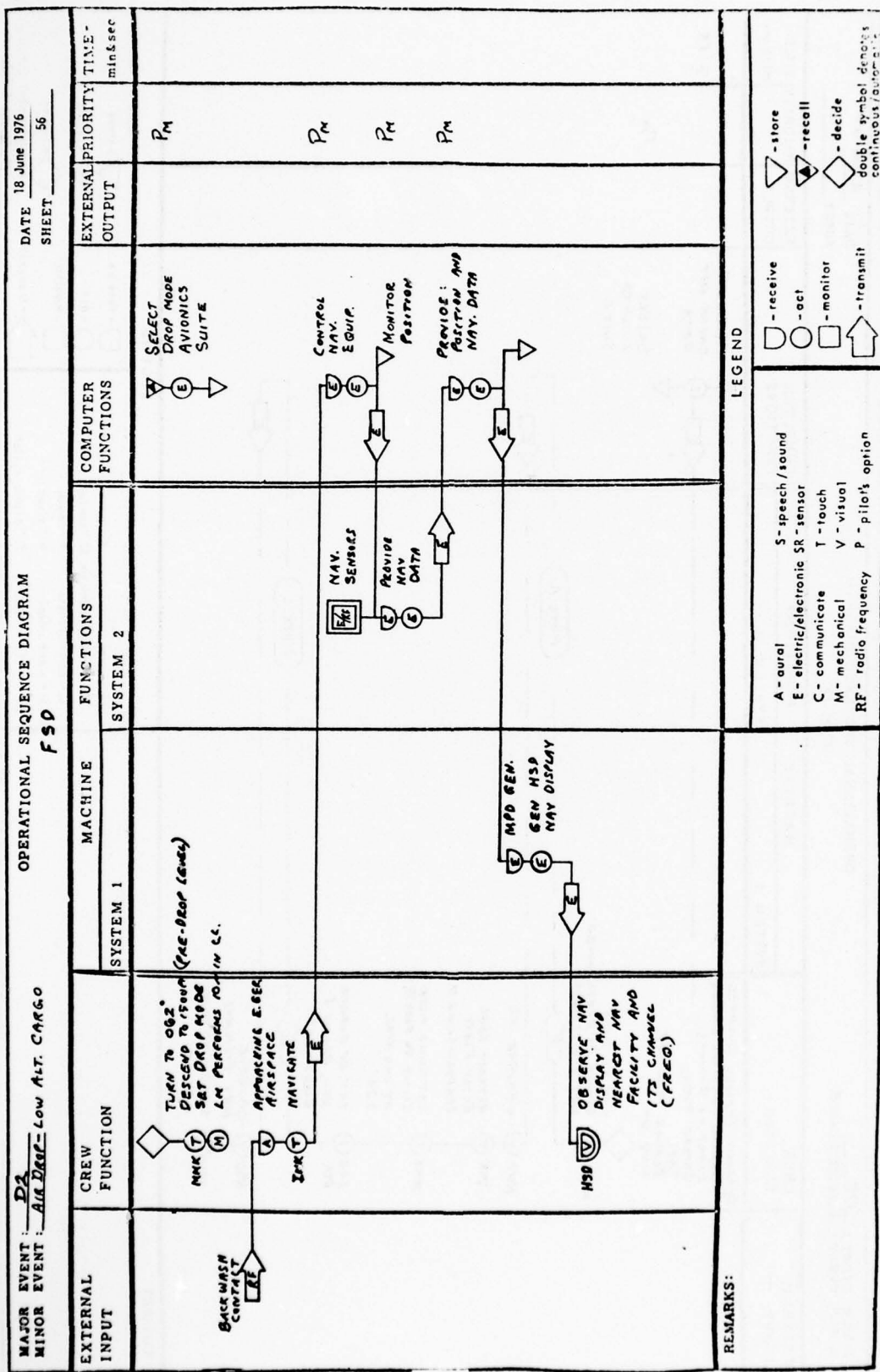
LEGEND

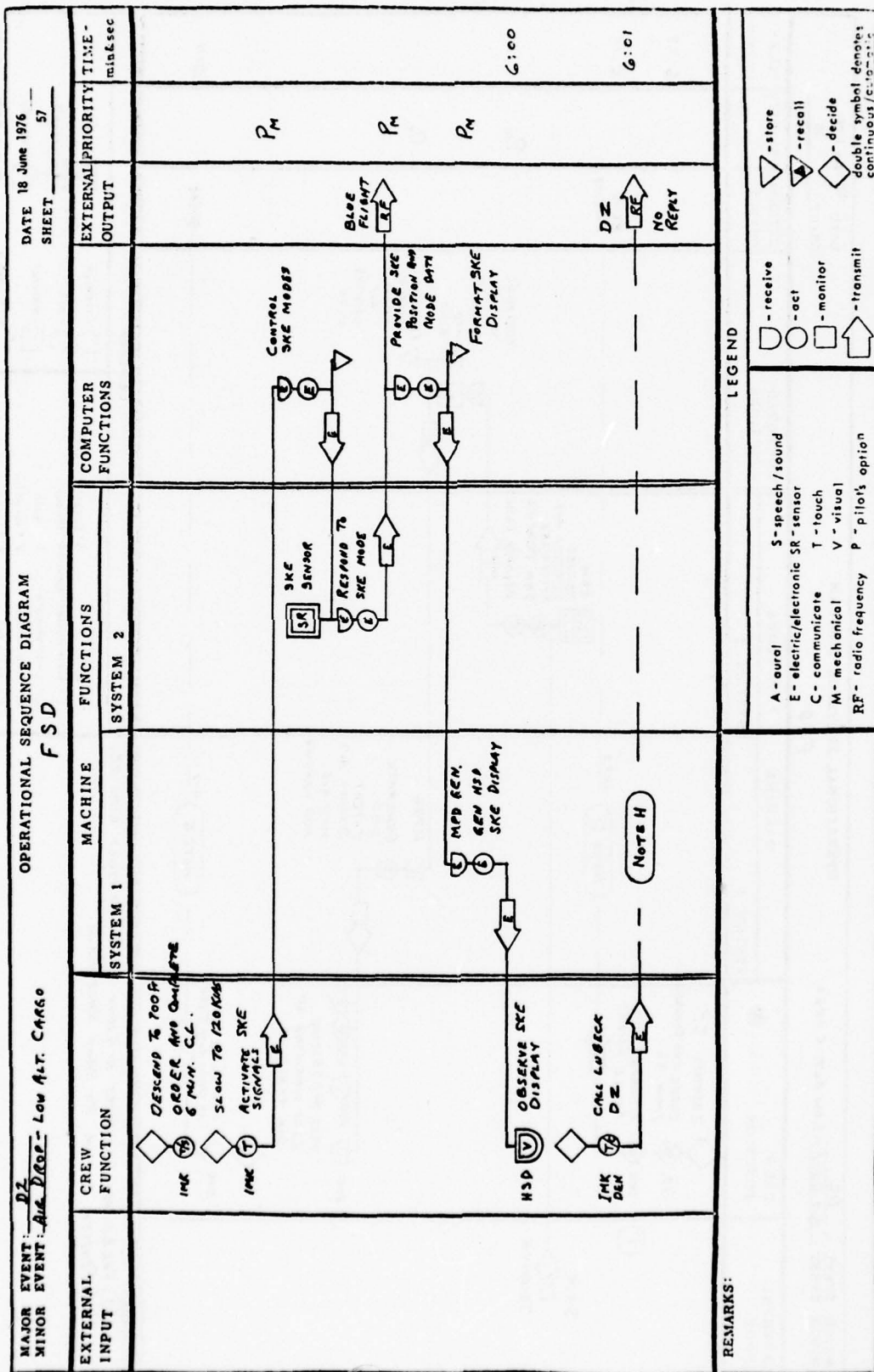
A - aural	S - speech / sound	- receive	- store
E - electric / electronic	SR - sensor	- act	- recall
C - communicate	T - touch	- monitor	- decide
M - mechanical	V - visual	- transmit	double symbol denotes continued function
RF - radio frequency	P - pilot's option		

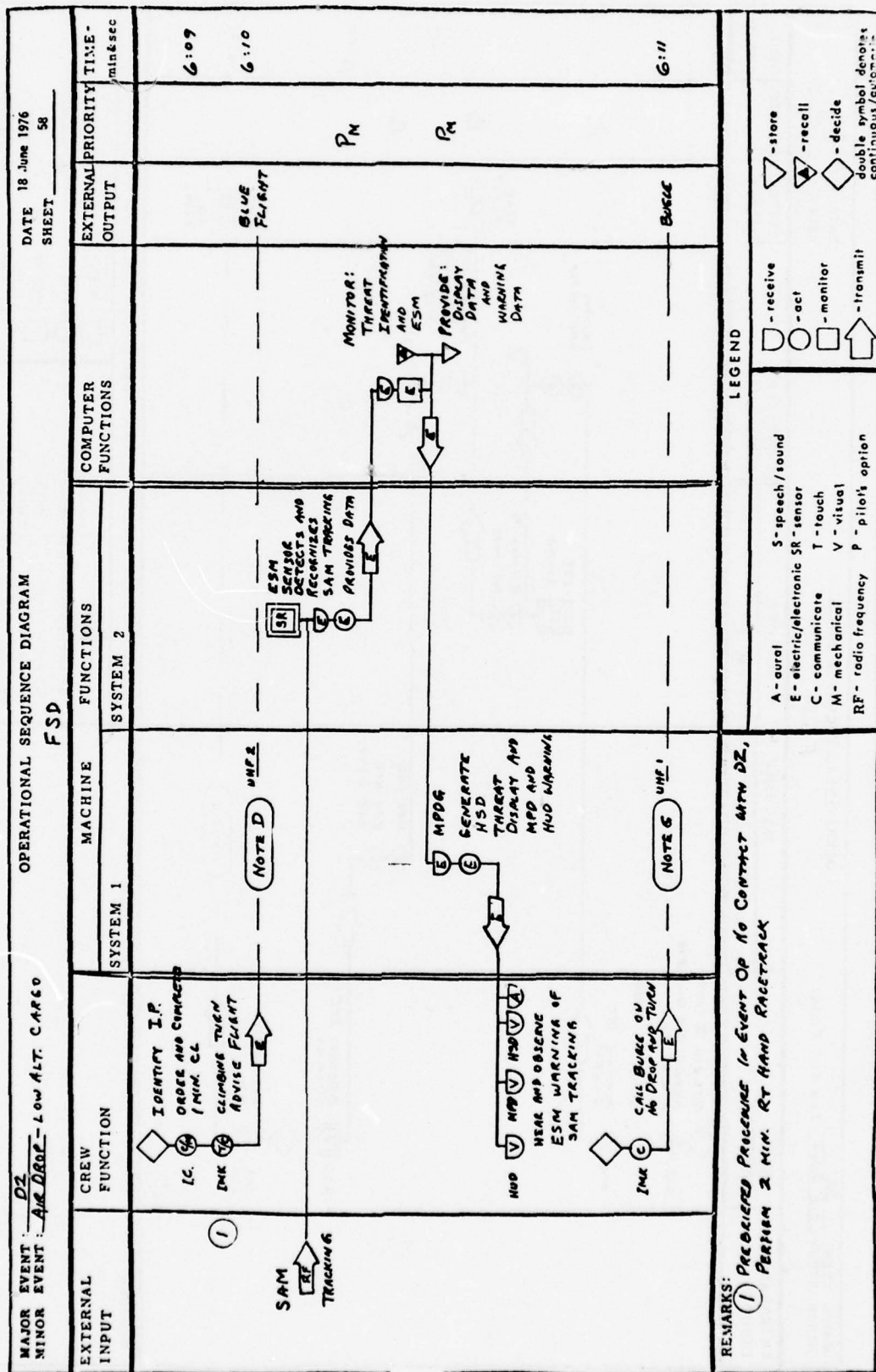

















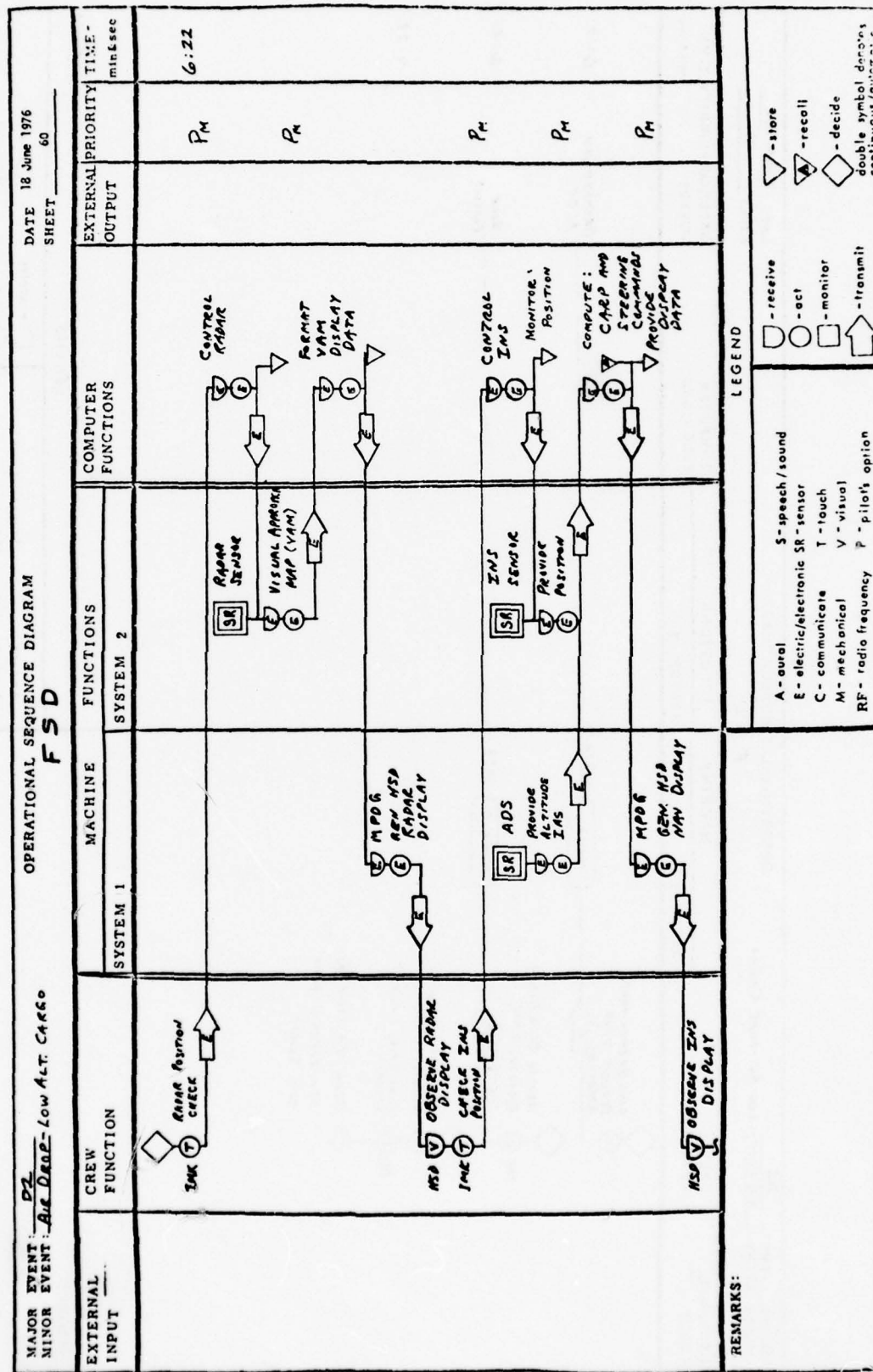


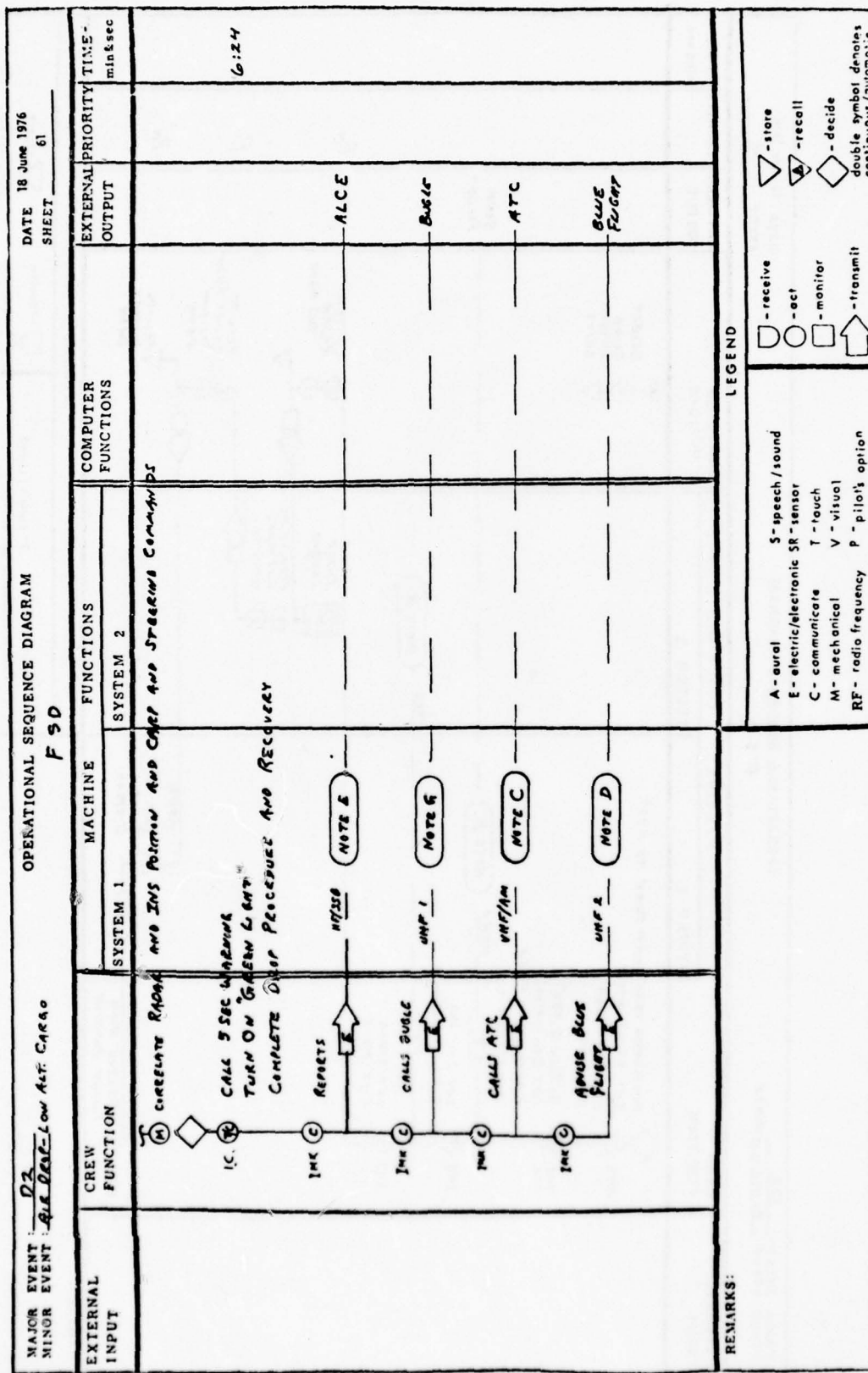
MAJOR EVENT: <u>D2</u> MINOR EVENT: <u>Low Altitude Cargo</u>		OPERATIONAL SEQUENCE DIAGRAM			DATE: 18 June 1976	SHEET: 59
		F S D				
EXTERNAL INPUT	CREW FUNCTION	MACHINE		COMPUTER FUNCTIONS	EXTERNAL OUTPUT	TIME - min:sec
		SYSTEM 1	SYSTEM 2			
	CALL BREMEK HAVEN REQUEST DROP APPROVAL 	NOTE			BREMEK HAVEN ALCE	6:15
	ADVISE BLUE FLIGHT RELAYING DROP CLEARANCE 	NOTE D			BLUE FLIGHT	6:21
	DESCEND TO 700 FT INBOUND TO DZ PILOT CALLS / MWD. IC. 					6:21
	SLOW TO 120 KTS SET SPEED BRAKES SET FLAPS 					

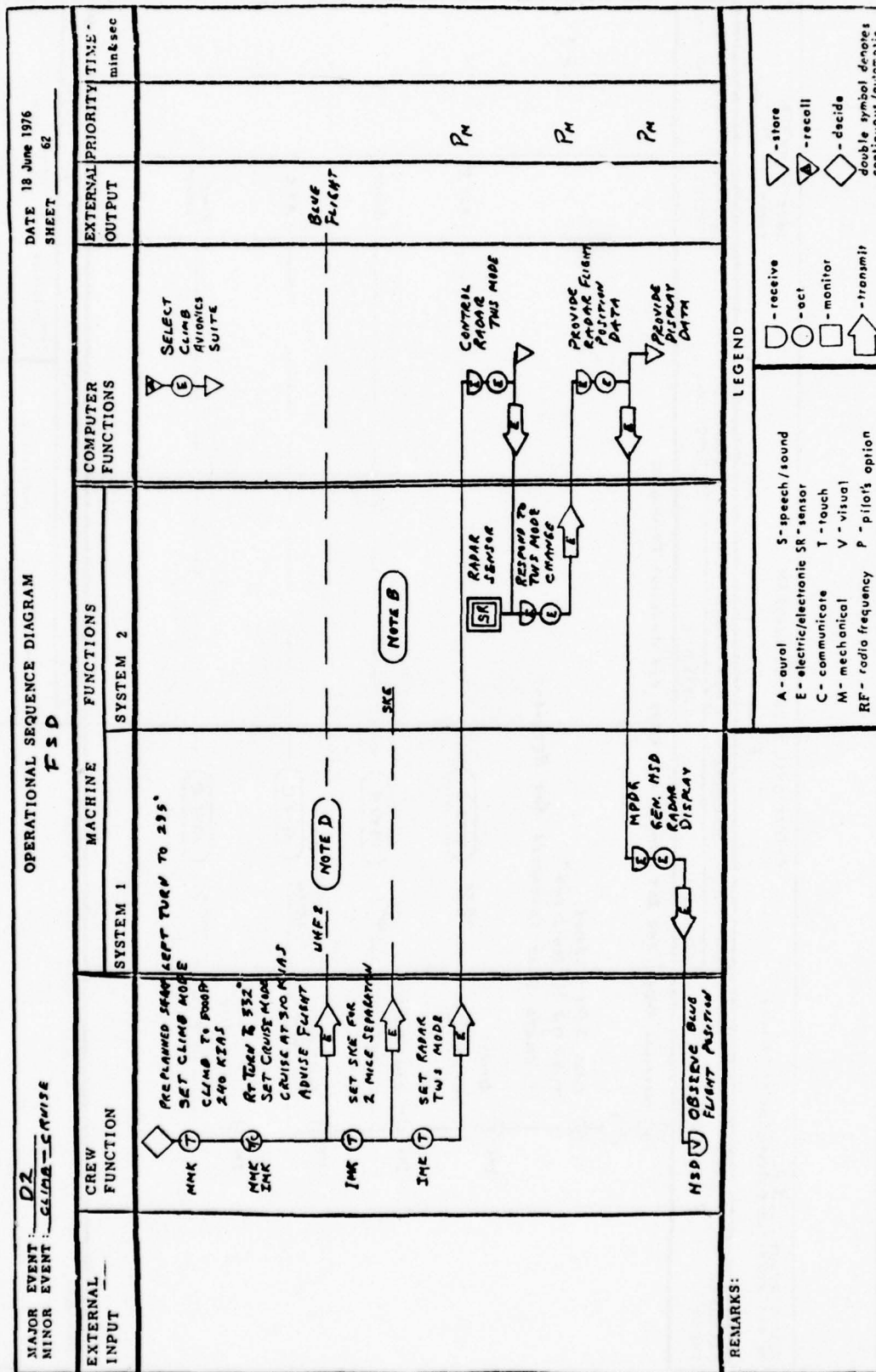
REMARKS:

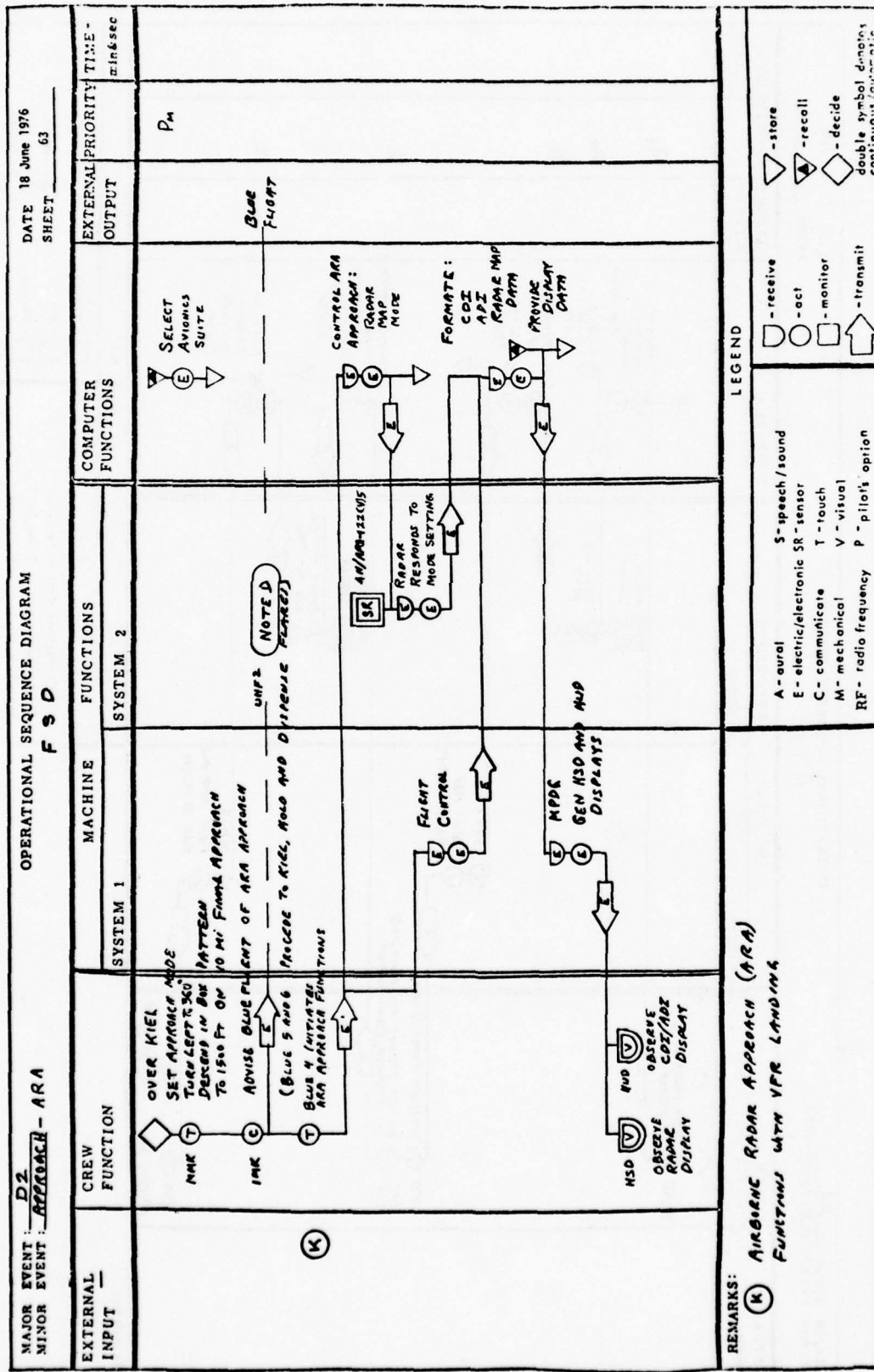
LEGEND

A - aural	S - speech / sound	 - store
E - electric / electronic	SR - sensor	 - recall
C - communicate	T - touch	 - decide
M - mechanical	V - visual	double symbol denotes continuous / automatic
RF - radio frequency	P - pilot's option	



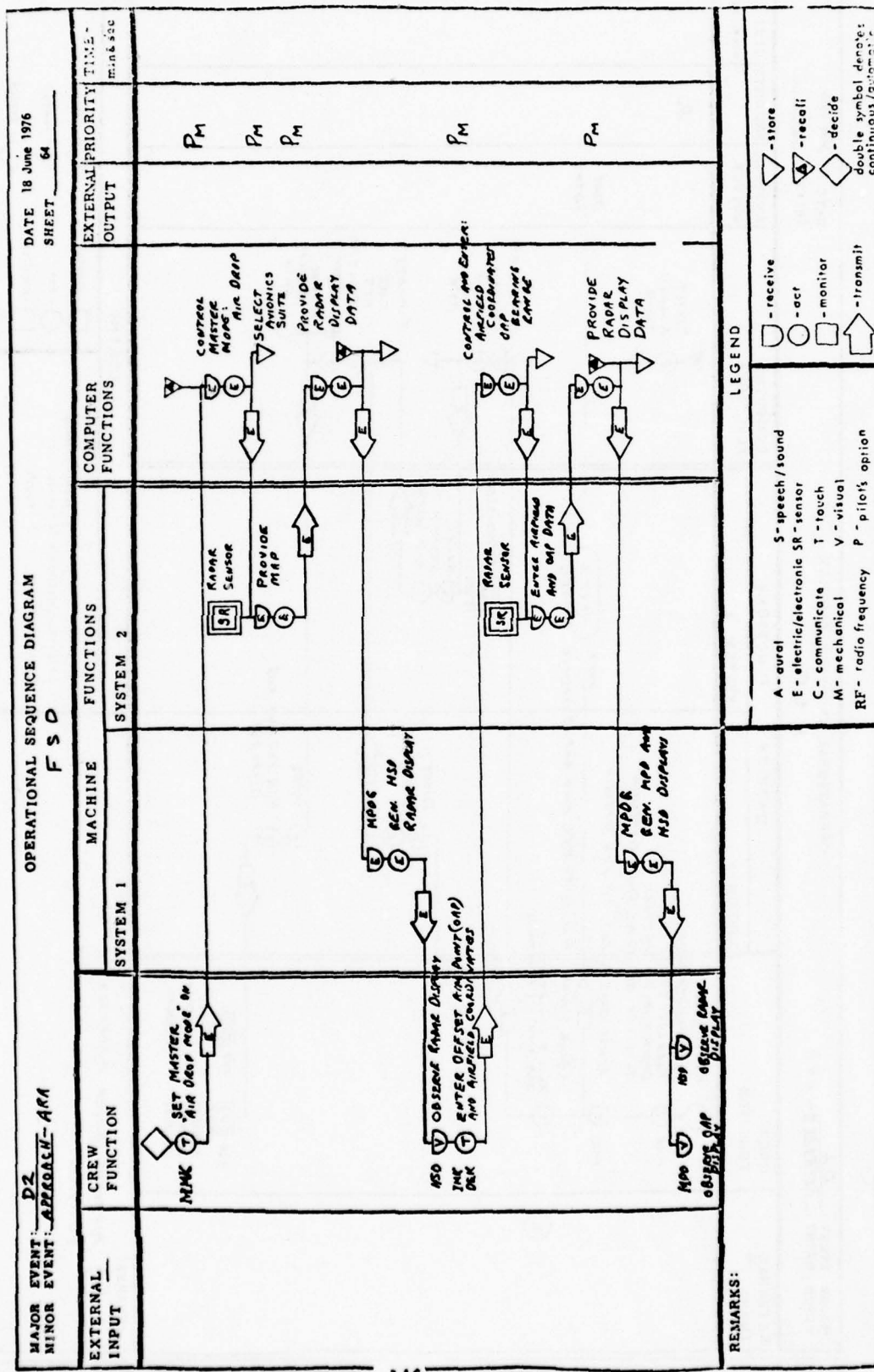


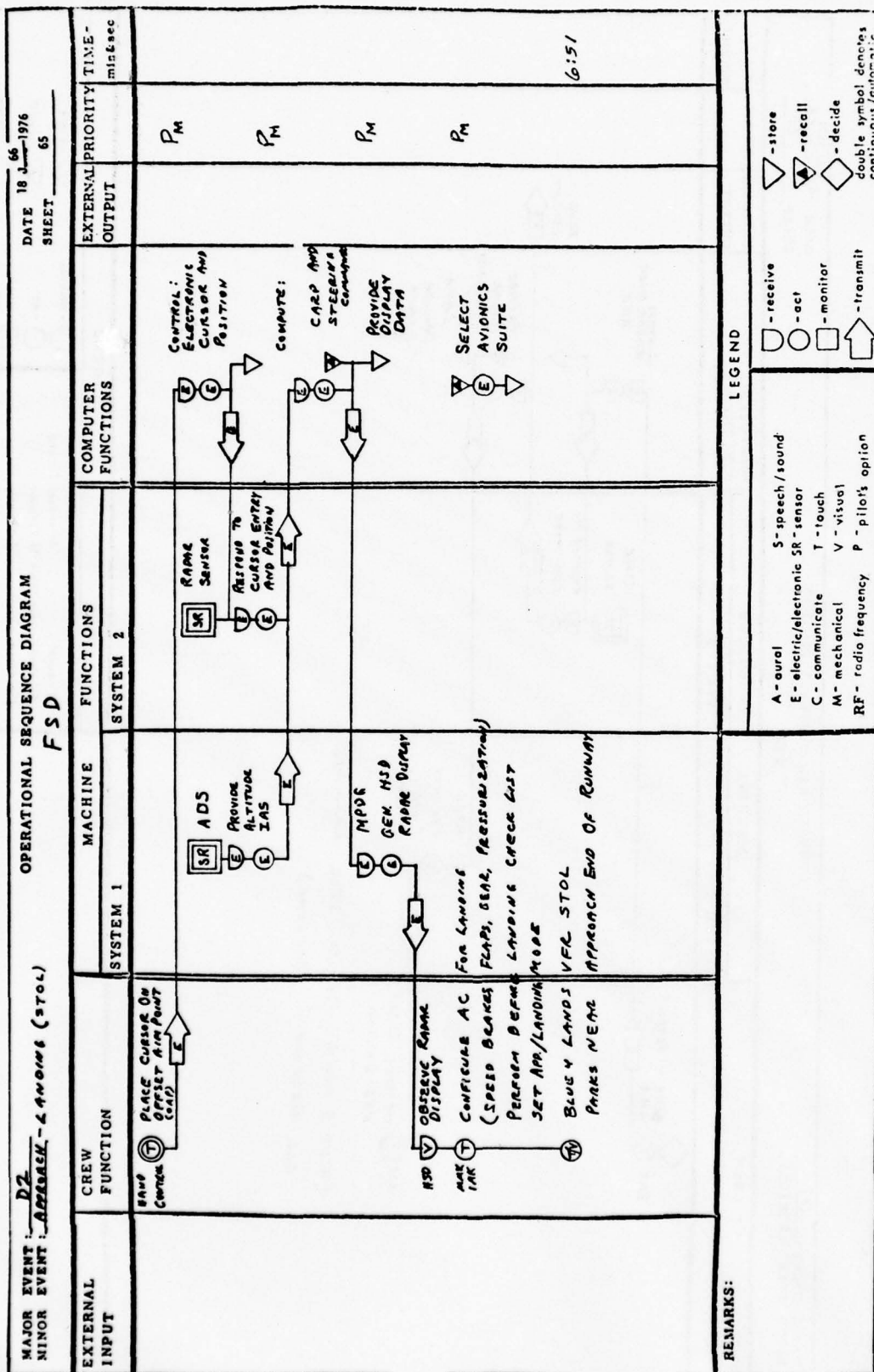


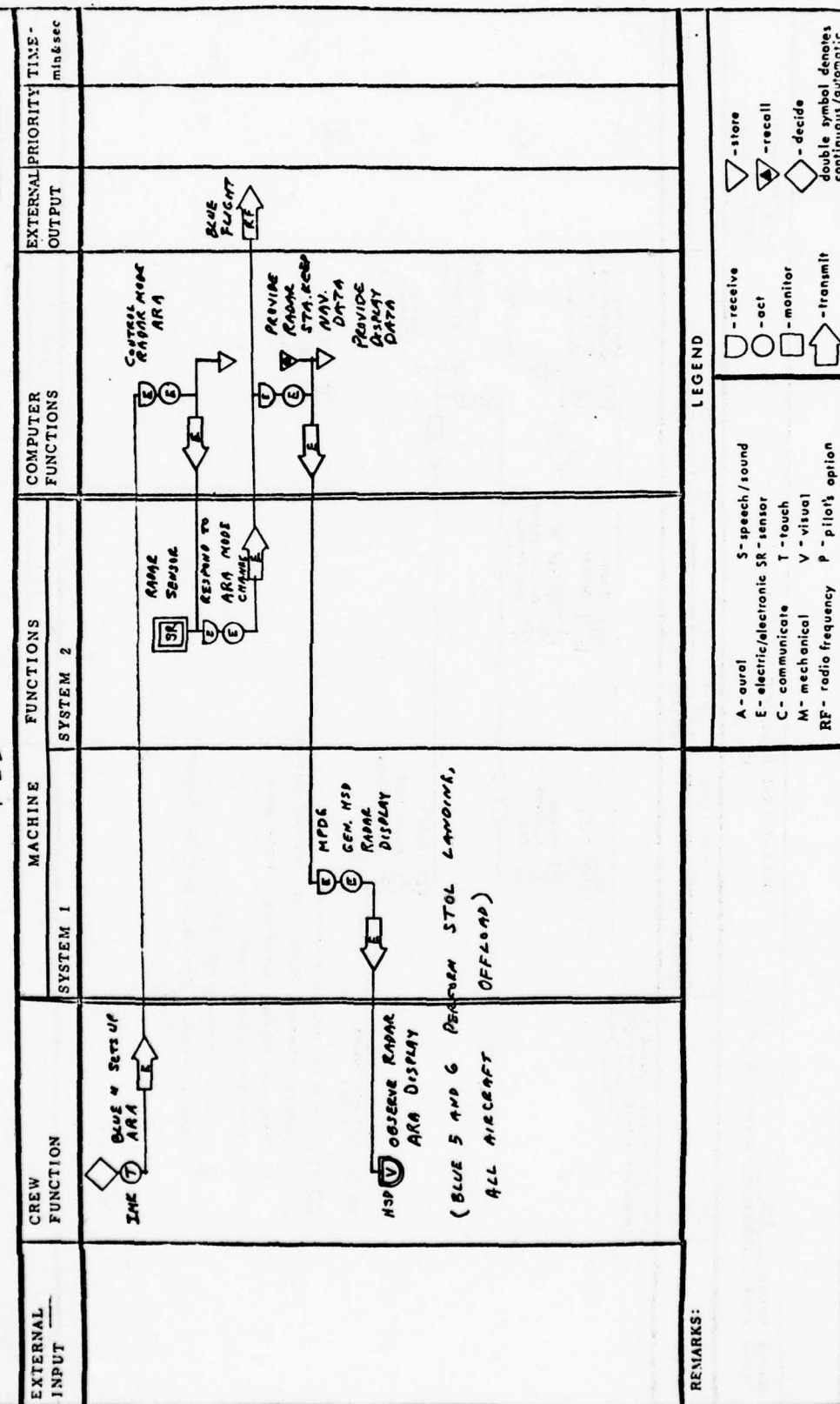


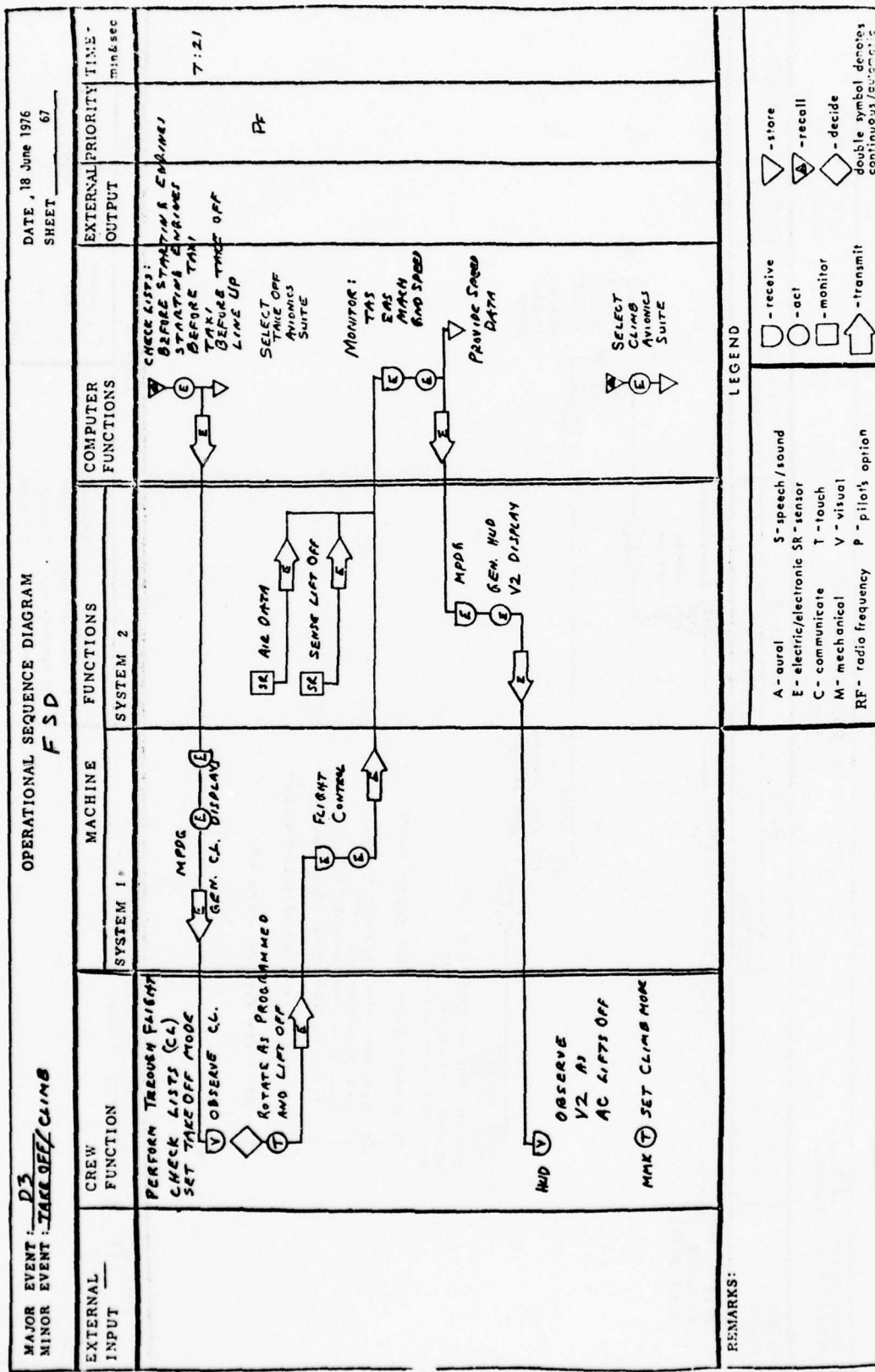
REMARKS: (K) AIRBORNE RADAR APPROACH (ARA)
FUNCTIONS WITH VFR LANDING

- LEGEND
- A - aural
 - E - electric/electronic
 - C - communicate
 - M - mechanical
 - RF - radio frequency
 - S - speech/sound
 - SR - sensor
 - T - touch
 - V - visual
 - P - pilot's option
 - - receive
 - - act
 - - monitor
 - ↑ - transmit
 - △ - store
 - ▲ - recall
 - ◇ - decide
 - double symbol - means continuous/over time









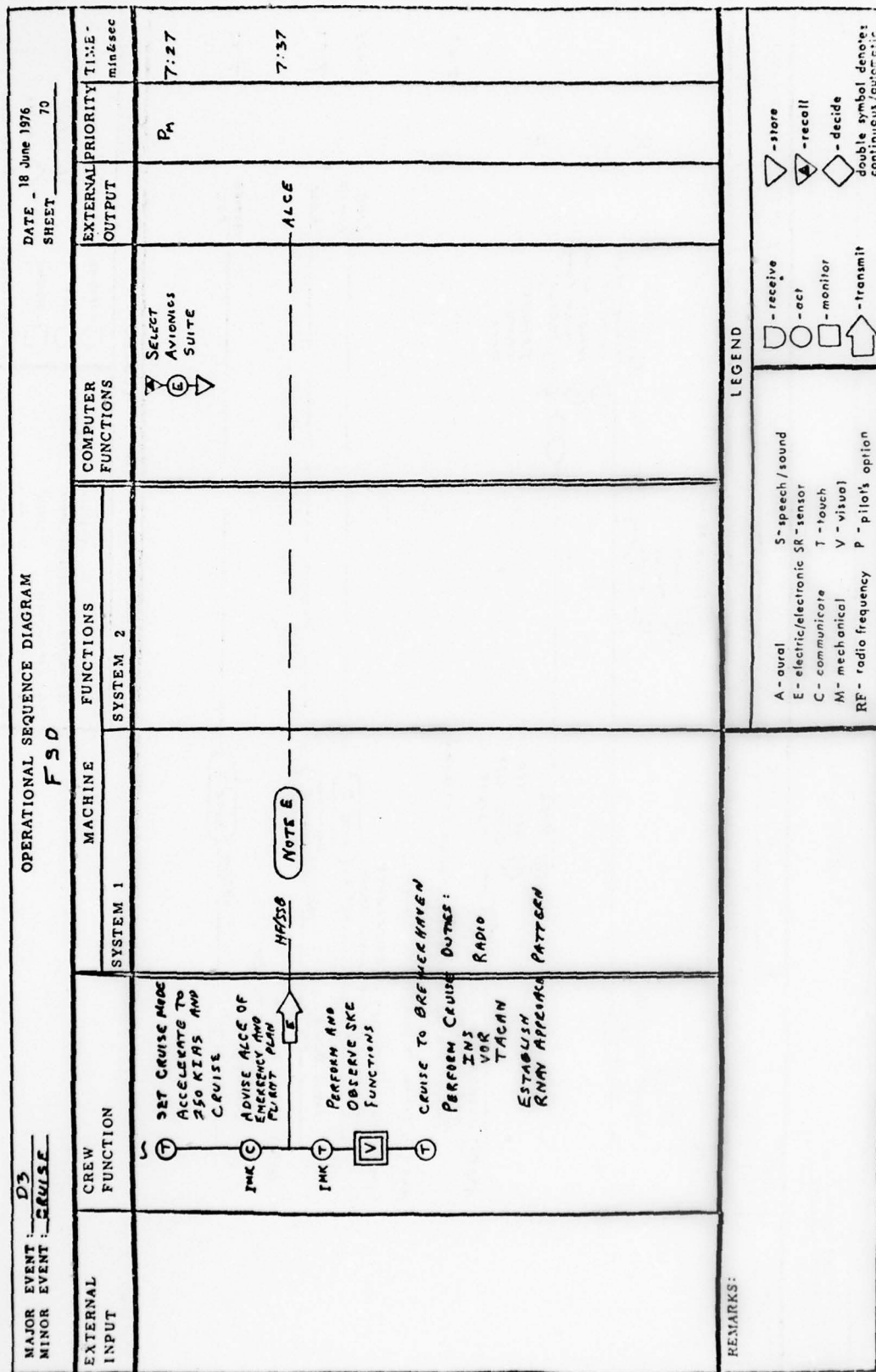
MAJOR EVENT: D3 OPERATIONAL SEQUENCE DIAGRAM DATE: 18 June 1976
 MINOR EVENT: CUSA FSD SHEET: 68

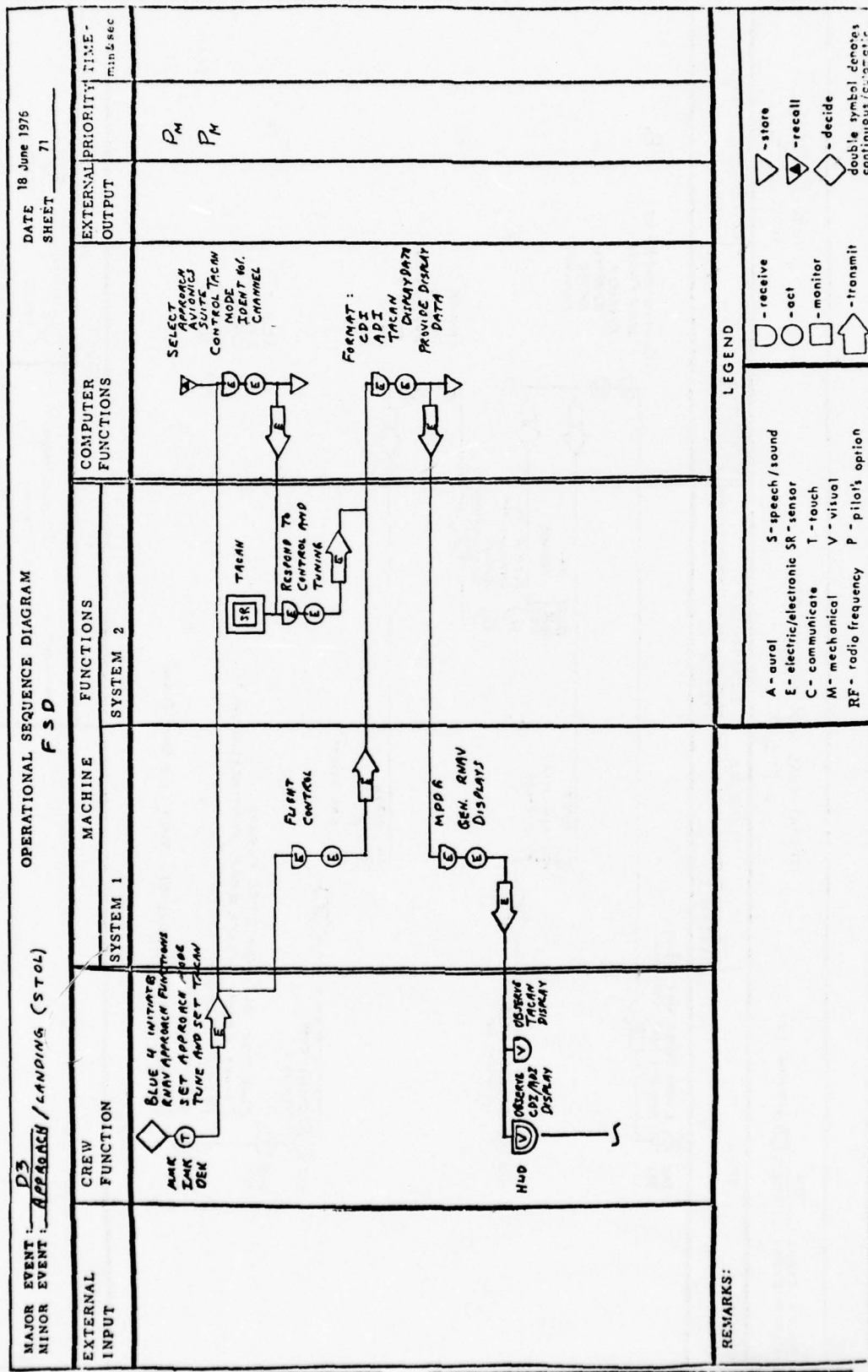
EXTERNAL INPUT	CREW FUNCTION	MACHINE		COMPUTER FUNCTIONS	EXTERNAL PRIORITY OUTPUT	TIME - min & sec
		SYSTEM 1	SYSTEM 2			
(BLUE 4 HIT BY SMALL ARMS FIRE)	<p>HUD MP (V) (V)</p> <p>OBSERVE MASTER CAUTION LIGHTS</p> <p>OBSERVE FIRE WARNING AND FUEL PRESSURE LIGHTS</p> <p>RETRACT GEAR AND RESET FLAPS</p> <p>IDENTIFY FAULTS ENGINE AS No. 1</p> <p>MOVE THROTTLE TO OFF</p> <p>PULL No. 1 FIRE HANDLE</p> <p>ACTIVATE No. 1 FIRE EXTINGUISHER</p> <p>OBSERVE FIRE WARNING LIGHT GO OUT</p> <p>JETTISON FUEL TO 4000 LB.</p>	<p>MPDG</p> <p>GEN. MPD AND</p> <p>W/O DISPLAY</p>	<p>SR</p> <p>AIRFRAME AND ENGINE SENSORS PROVIDE STATUS</p>	<p>CONTROL: AIRFRAME AND ENGINE SENSOR DISPLAY PROVIDE STATUS DATA</p>	<p>(1)</p> <p>P_S</p> <p>P_S</p>	7:22

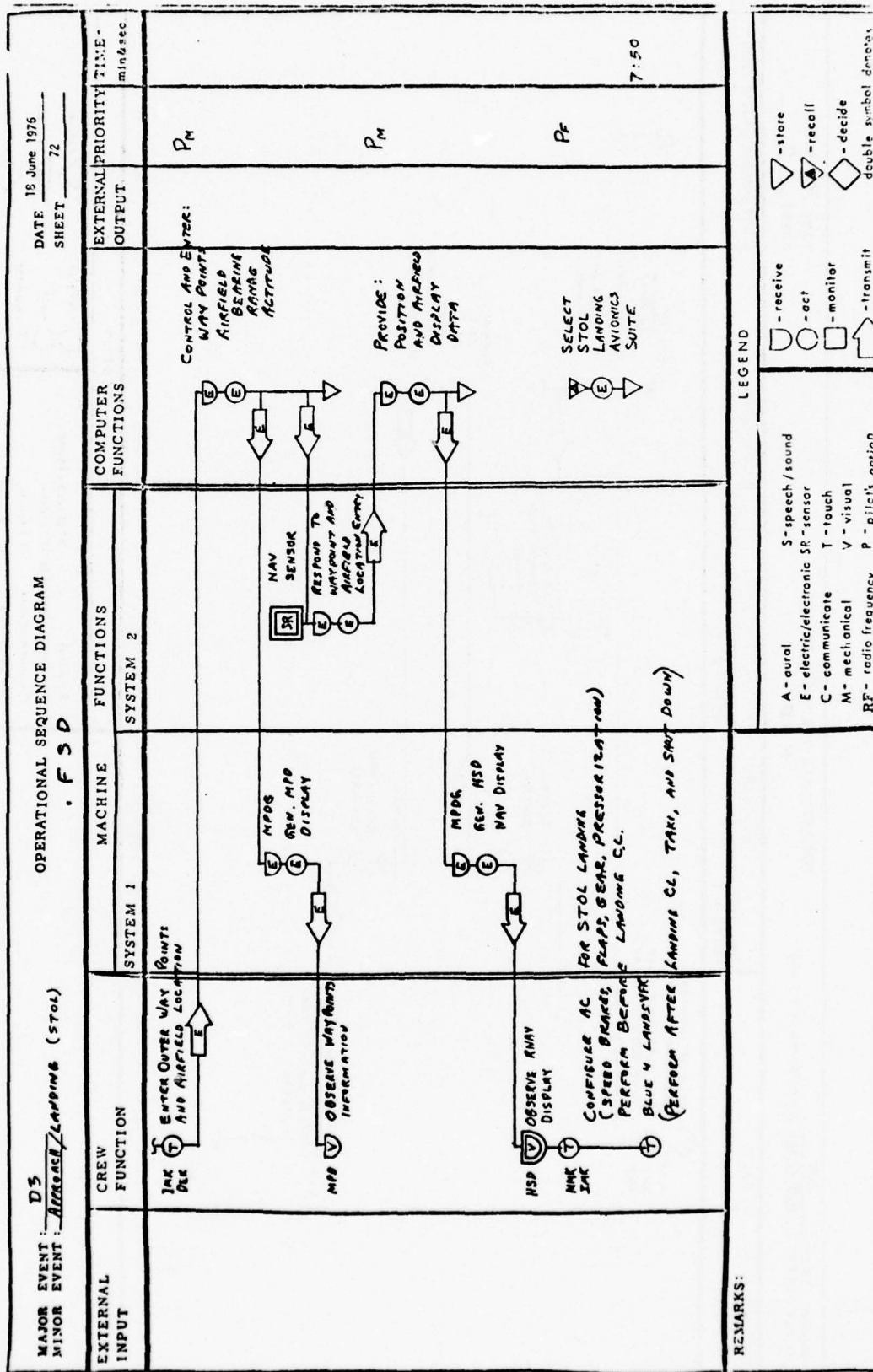
REMARKS: (1) P_S PRIORITY FLIGHT SURVIVAL *

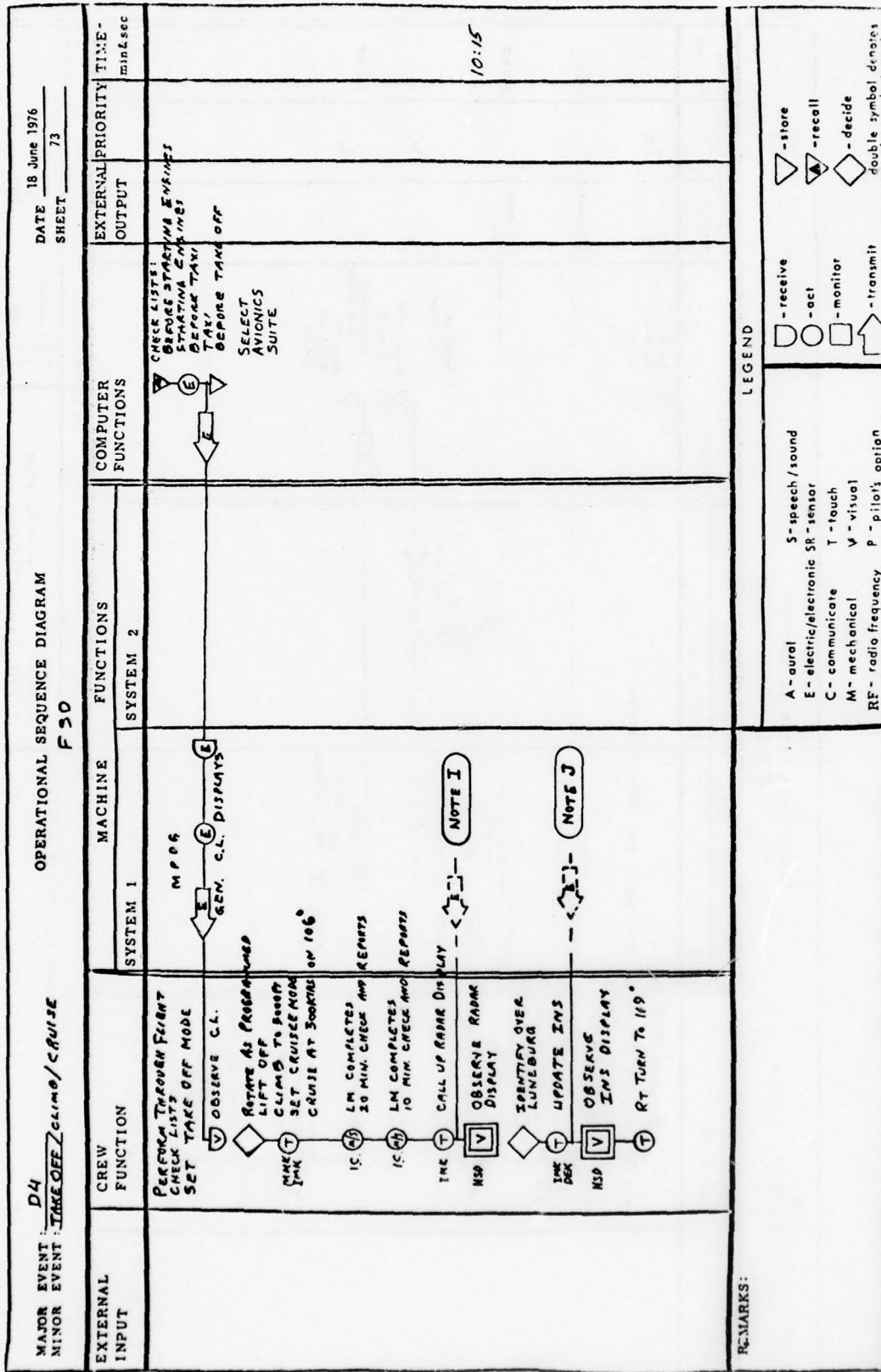
LEGEND

A - aural	S - speech / sound	□ - receive	△ - store
E - electric / electronic	SR - sensor	○ - act	▲ - recall
C - communicate	T - touch	□ - monitor	◇ - decide
M - mechanical	V - visual	↑ - transmit	double symbol denotes
RF - radio frequency	P - pilot's option		





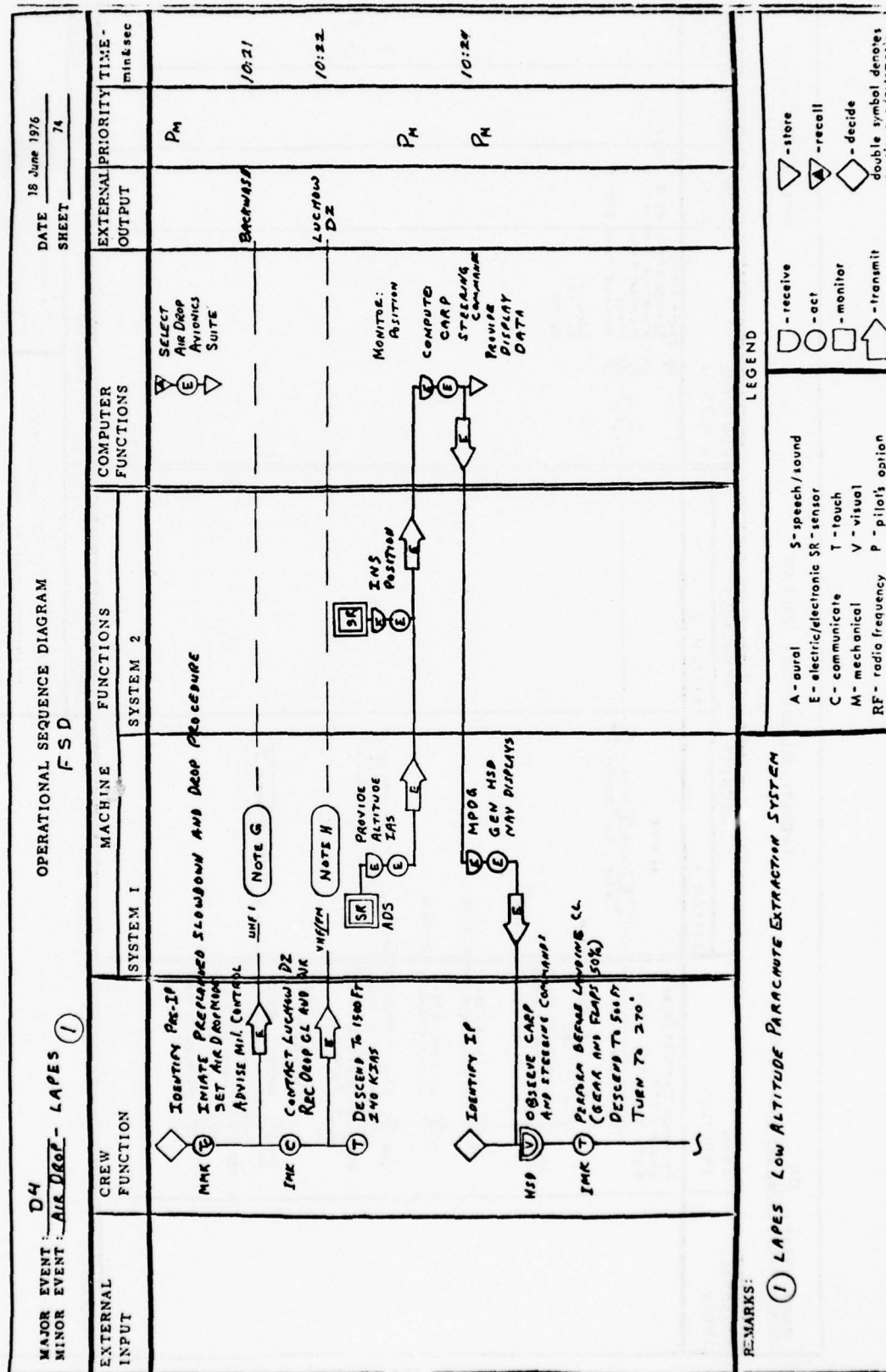




REMARKS:

LEGEND

- | | | | |
|-------------------------|--------------------|--------------|---|
| A - aural | S - speech / sound | □ - receive | △ - store |
| E - electric/electronic | SR - sensor | ○ - act | ▲ - recall |
| C - communicate | T - touch | □ - monitor | ◇ - decide |
| M - mechanical | V - visual | ↑ - transmit | double symbol denotes continuous function |
| RF - radio frequency | P - pilot's option | | |

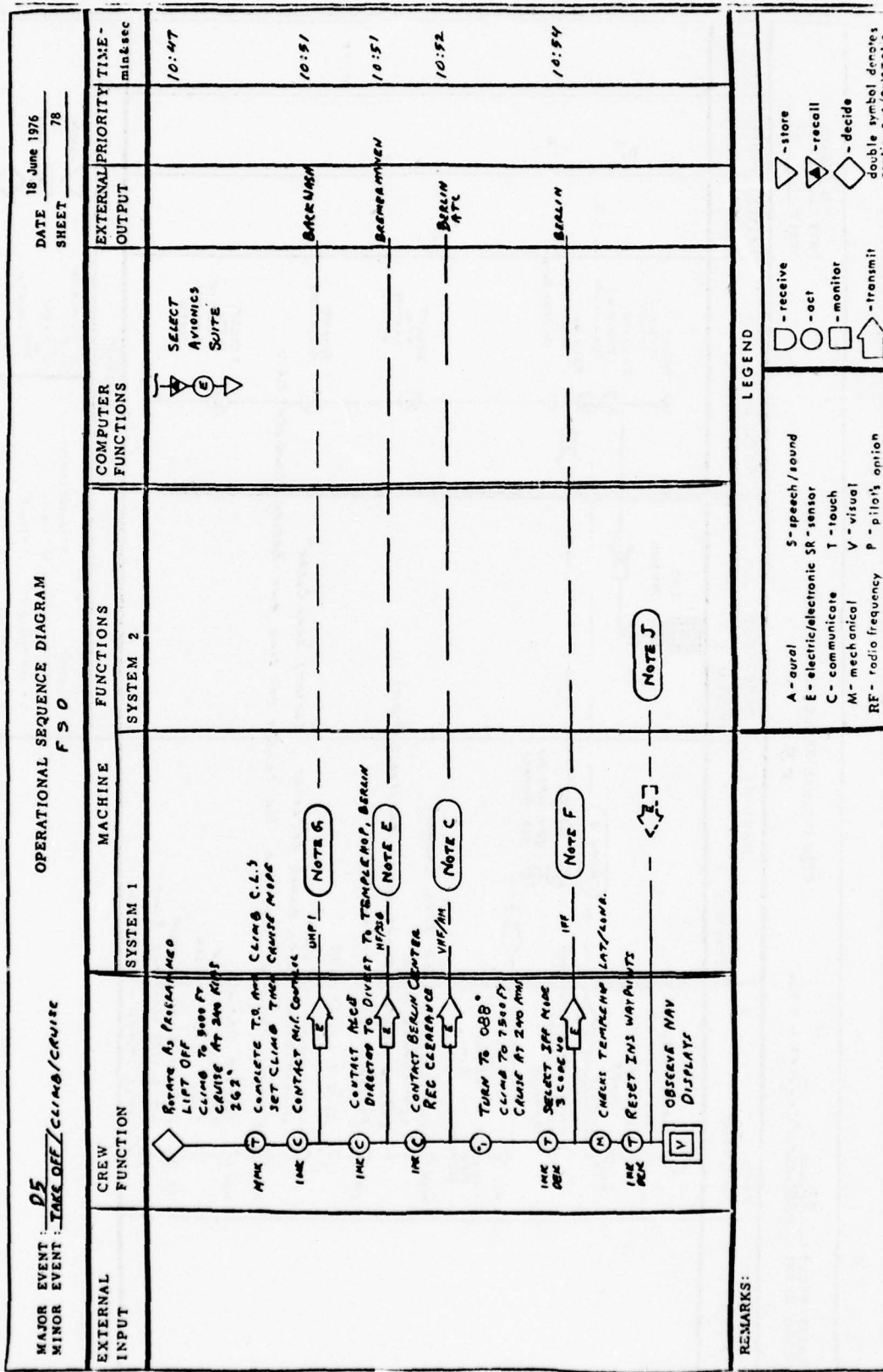


MAJOR EVENT: <u>D4</u> MINOR EVENT: <u>Air Drop - LAPES</u>		OPERATIONAL SEQUENCE DIAGRAM FSD		DATE: <u>10 June 1976</u> SHEET: <u>75</u>		
EXTERNAL INPUT	CREW FUNCTION	MACHINE	FUNCTIONS	COMPUTER FUNCTIONS	EXTERNAL PRIORITY OUTPUT	TIME - min & sec
		SYSTEM 1	SYSTEM 2			
	IC (S) 1 MIN WARNING LM ACK RED LIGHT ON					10:27
	IC (S) DESCEND TO 5 FT ACTUATE ADS LM CALLS ONE MINUTE STABILIZED GREEN LIGHT ON					10:28
	IC (S) LM CALLS LOAD CLEAR					10:29
	MMK (T) ADD POWER SET CLIMB START CLIMB TO 5000 FT 240 KIAT PERFORM "GO GEAR AND FLAP UP DOOR CLOSED AND LOCKED RED LIGHT OFF					
	MMK (T) REC. CHANGE IN LANDMARK LOCATION SET CRUISE MODE CRUISE					10:30
ALCE 328	MMK (T)					

LEGEND

A - aural	S - speech / sound	△ - store
E - electric/electronic SR - sensor		△ - recall
C - communicate	T - touch	◇ - decide
M - mechanical	V - visual	double symbol denotes both aural and visual
RF - radio frequency	P - pilot's option	

- receive
 - act
 - monitor
 - transmit



MAJOR EVENT: <u>05</u>		OPERATIONAL SEQUENCE DIAGRAM		DATE: 18 June 1976		
MINOR EVENT: <u>CBWEEC</u>		FSD		SHEET: 79		
EXTERNAL INPUT	CREW FUNCTION	MACHINE	FUNCTIONS	COMPUTER FUNCTIONS	EXTERNAL PRIORITY OUTPUT	TIME-min:sec
		SYSTEM 1	SYSTEM 2			
ELEC JAMMING	MSD (V) OBSERVE NAV DISPLAY JAMMING INR (T) CALL UP NAME MSD (V) OBSERVE NAME DISPLAY INCC (C) REQUEST BEELIN KNOW PROVIDE NAV ADJUST AUTHENTICITY	MSD6 GEN. MSD NAV DISPLAY NOTE I	VOR TACAN ADF Respond To JAMMING	PREPARE NAV. DISPLAY DATA	PM	10:56
ELECTRONIC INTERFERENCE	INCC (C) REQUEST BEELIN KNOW PROVIDE NAV ADJUST AUTHENTICITY A HEAR INTERFERENCE LOSE CONTACT	NOTE C	UNF 1 AND VHF/HA Respond To INTERFERENCE	CONTROL RANGOS	BEELIN	10:58
						11:00

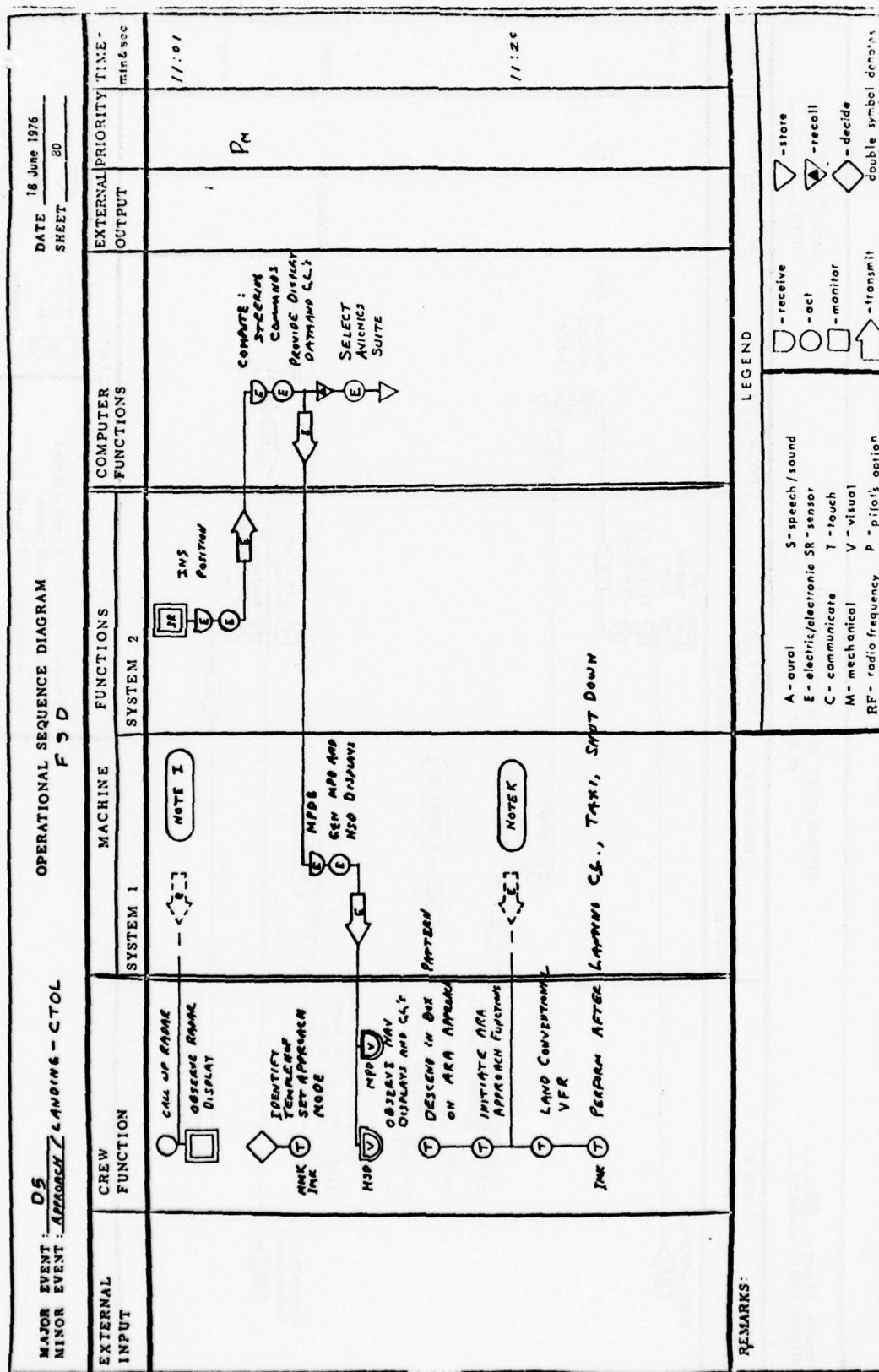
LEGEND

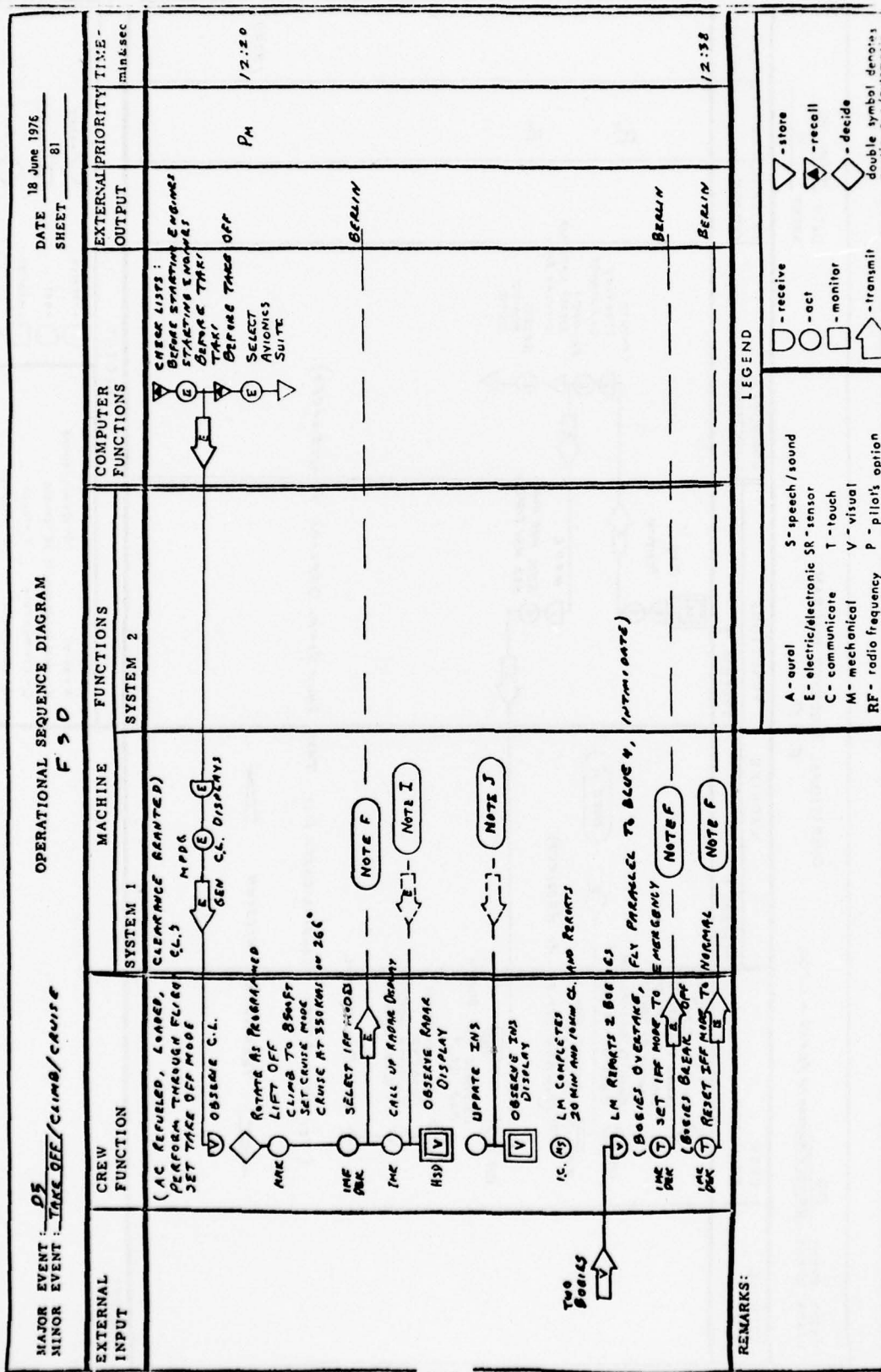
A - aural
E - electric/electronic SR - sensor
C - communicate
M - mechanical
RF - radio frequency
P - pilot's option

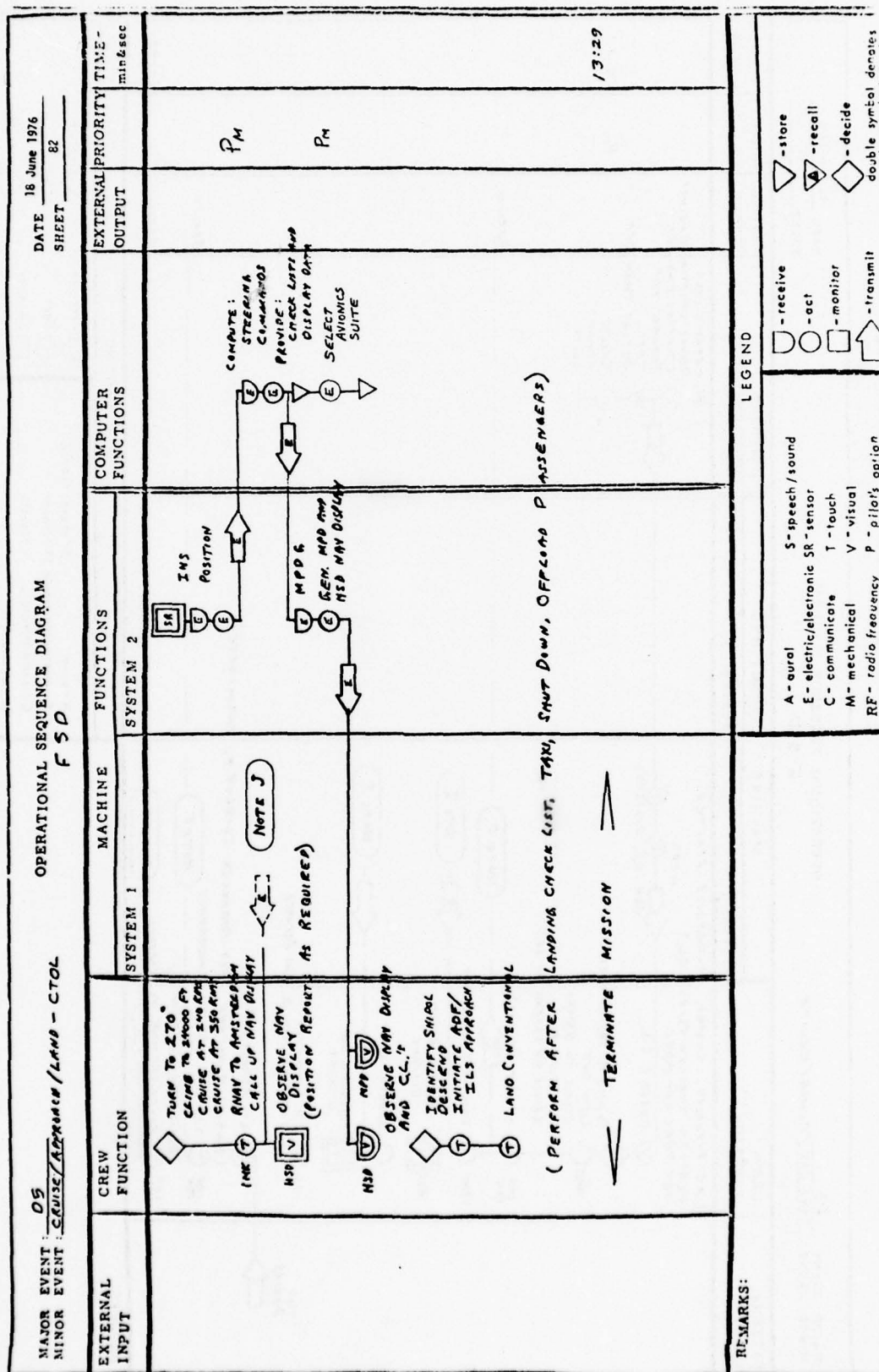
S - speech / sound
T - touch
V - visual

△ - store
▲ - recall
◇ - decide
double symbol denotes

□ - receive
○ - act
□ - monitor
↑ - transmit



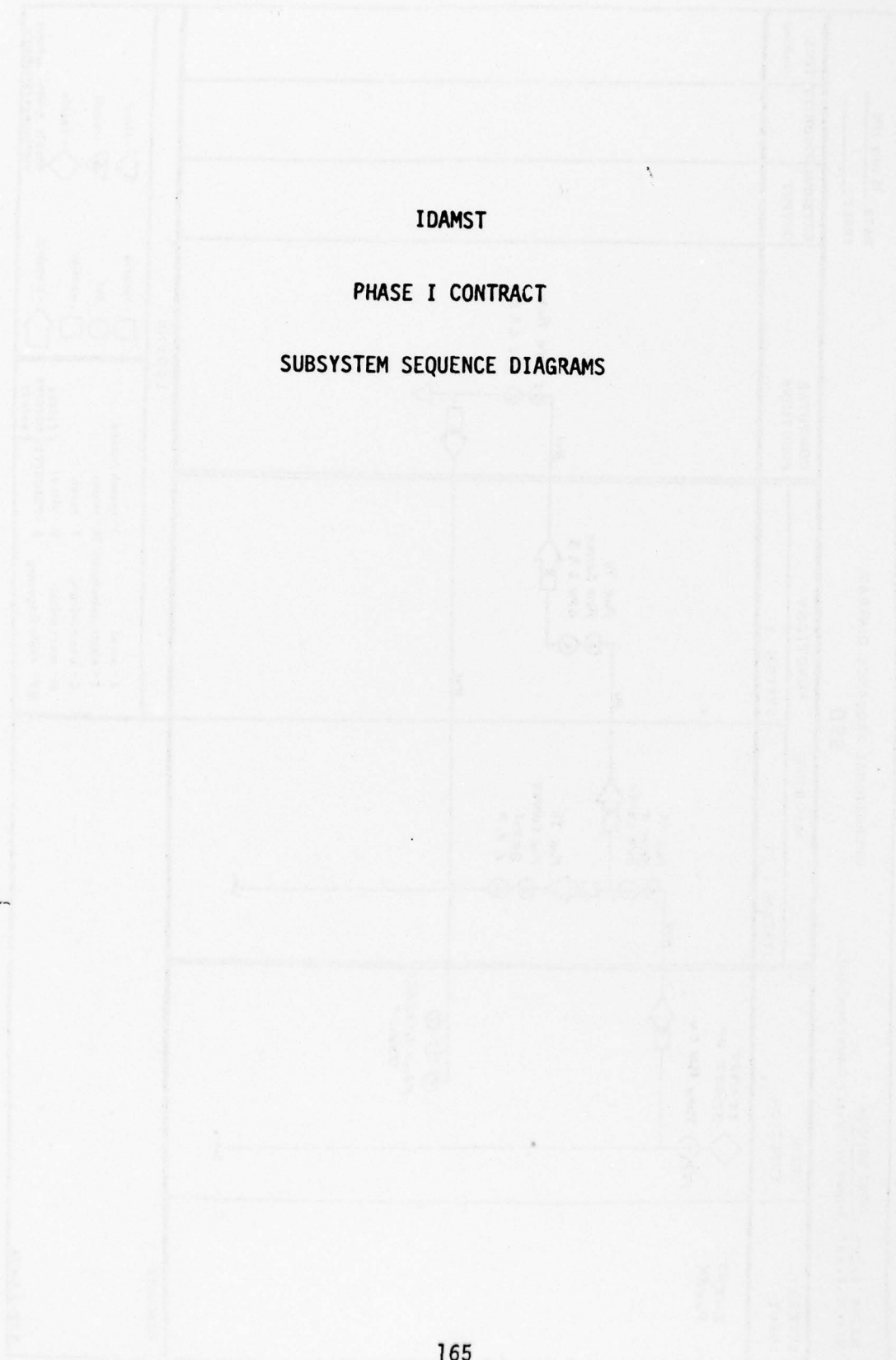




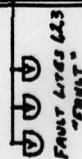
IDAMST

PHASE I CONTRACT

SUBSYSTEM SEQUENCE DIAGRAMS

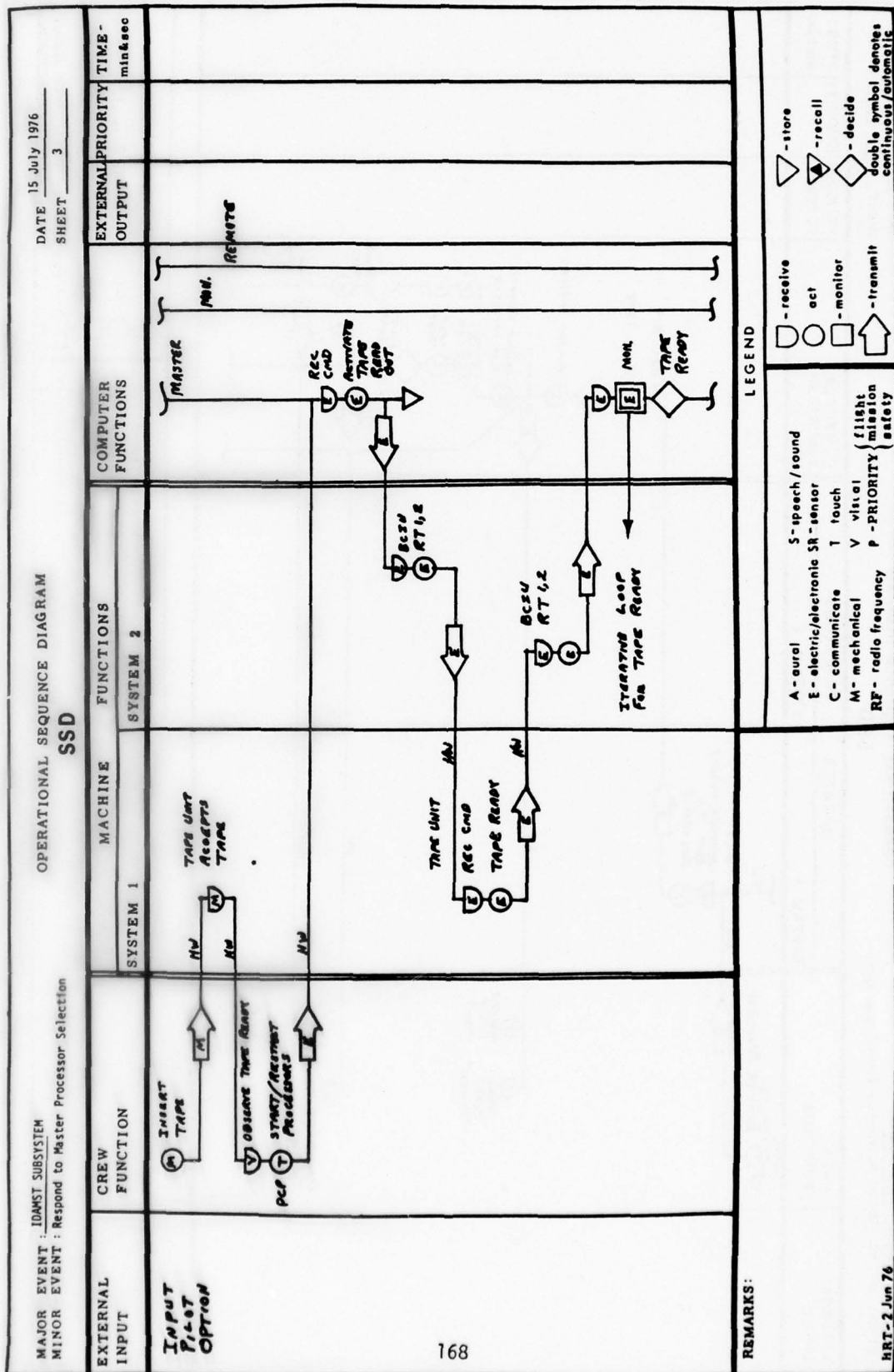


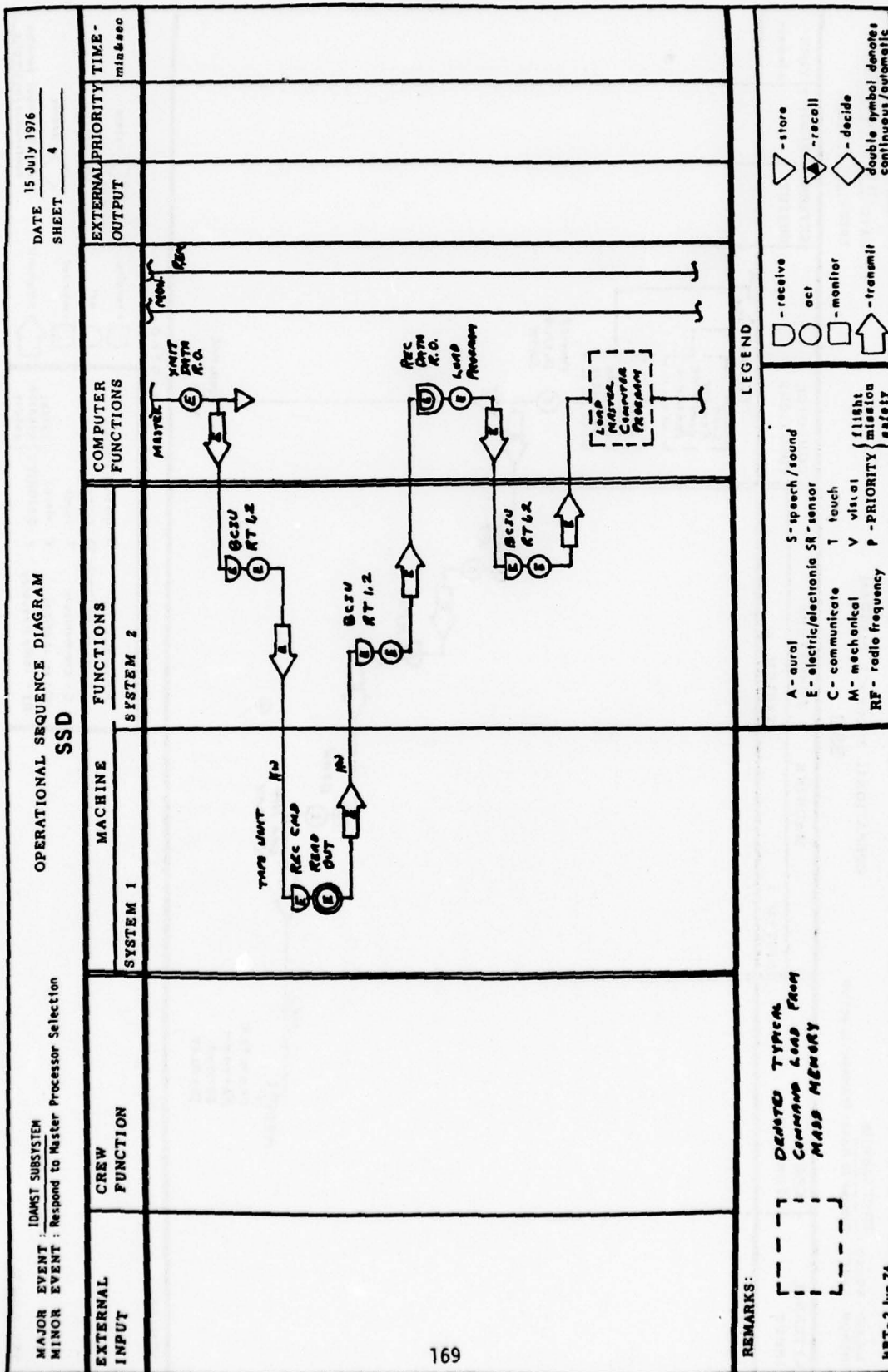
FUNCTIONS

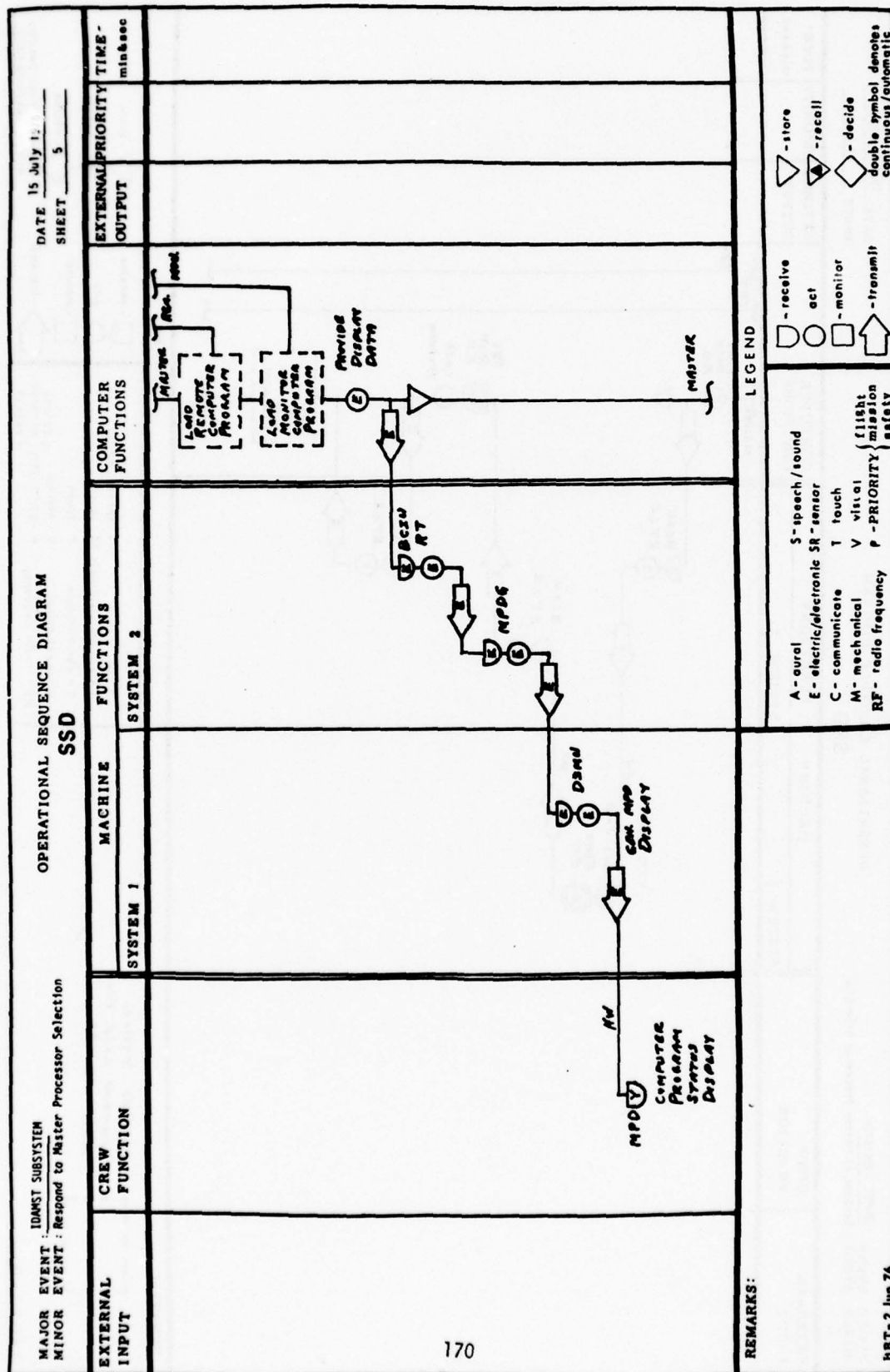


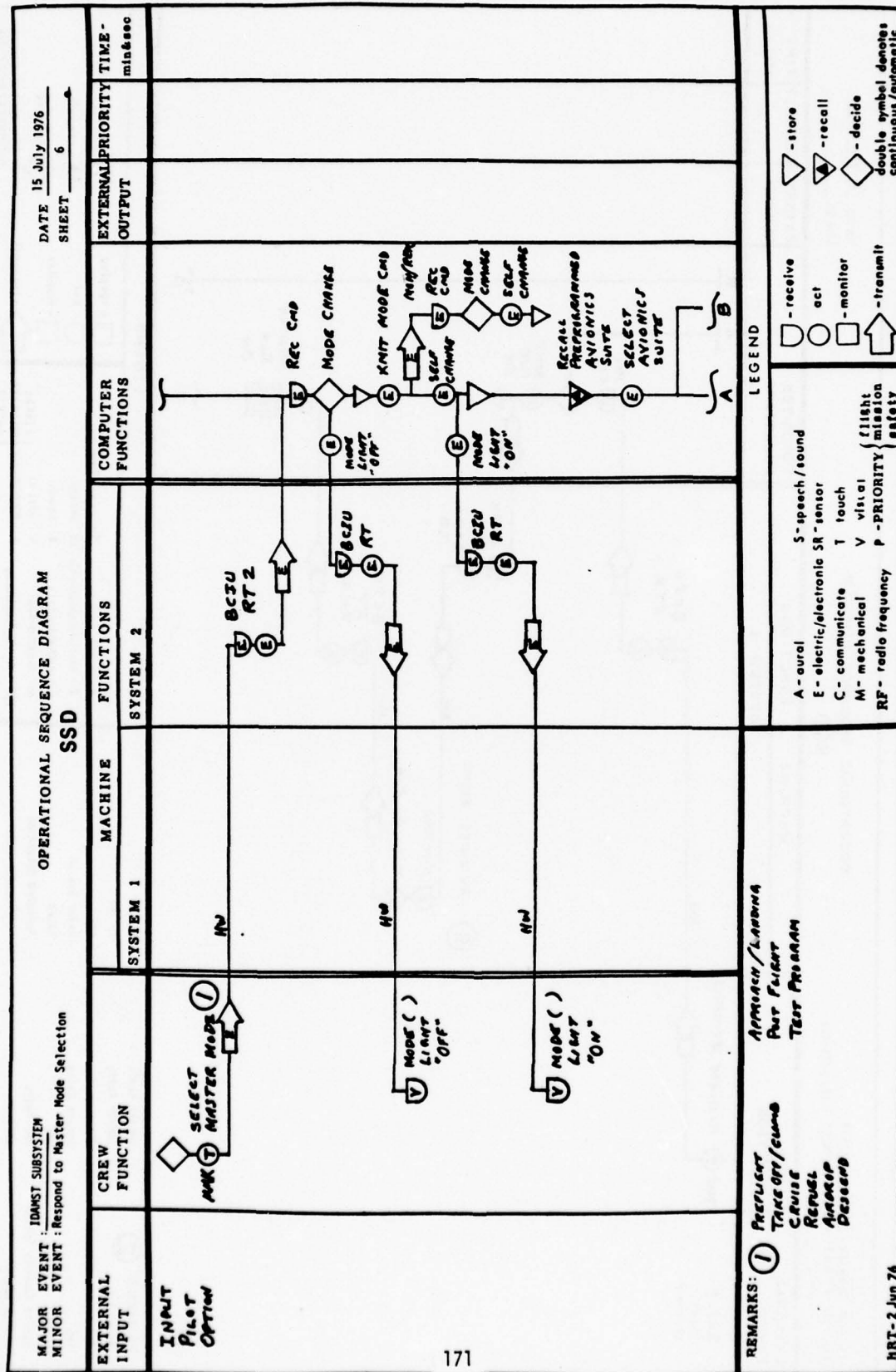
A - aural	S - speech/sound	- receive	▷	- store
E - electric/electronic	SR - sensor	act	▷	- recall
C - communicate	T - touch	- monitor	◻	- decide
M - mechanical	V - visual		◻	
RF - radio frequency	P - PRIORITY { flight mission safety }	- transmit	↑	double symbol denotes continuous/automatic

HRT-2 Jun 76





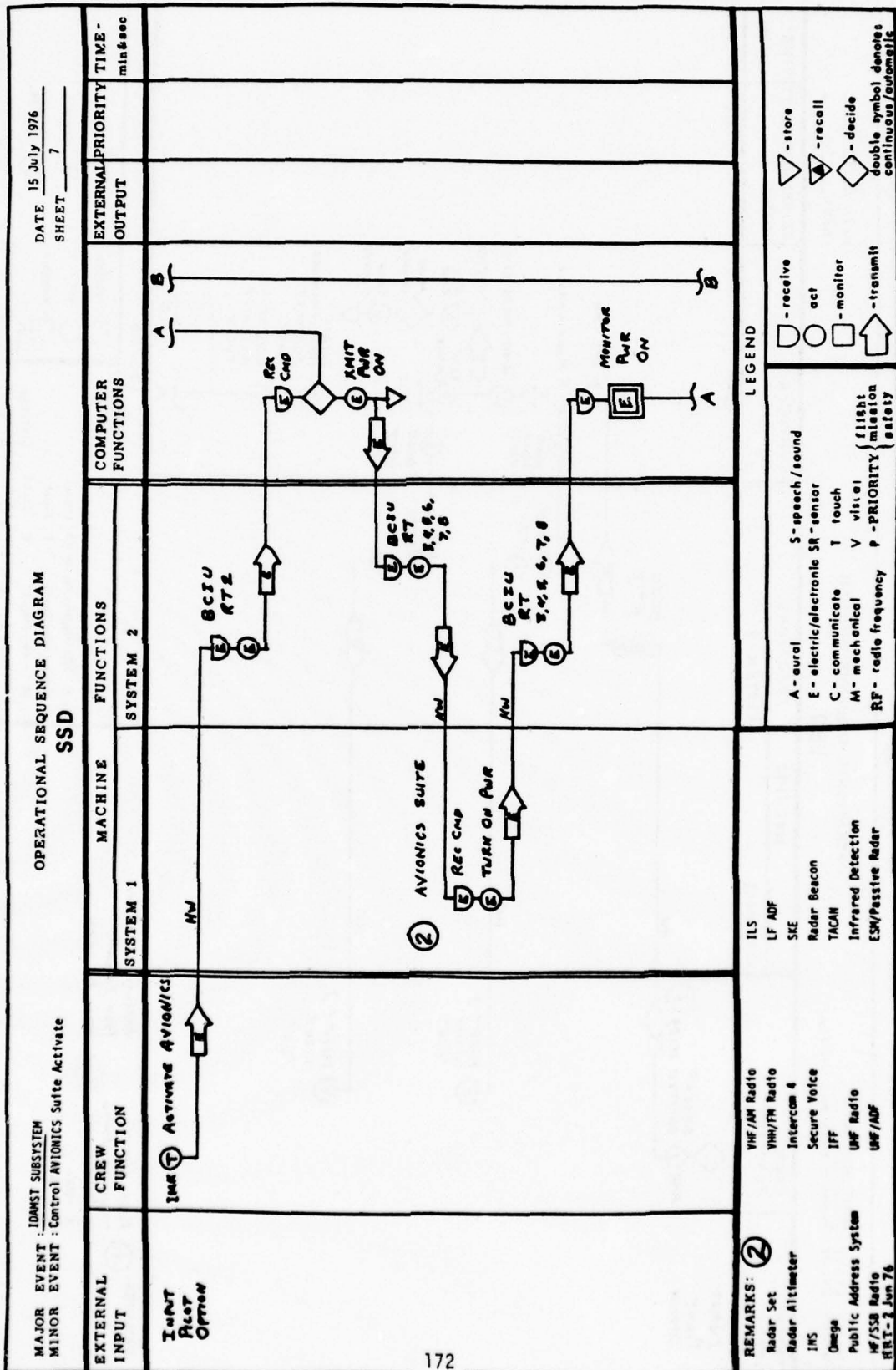


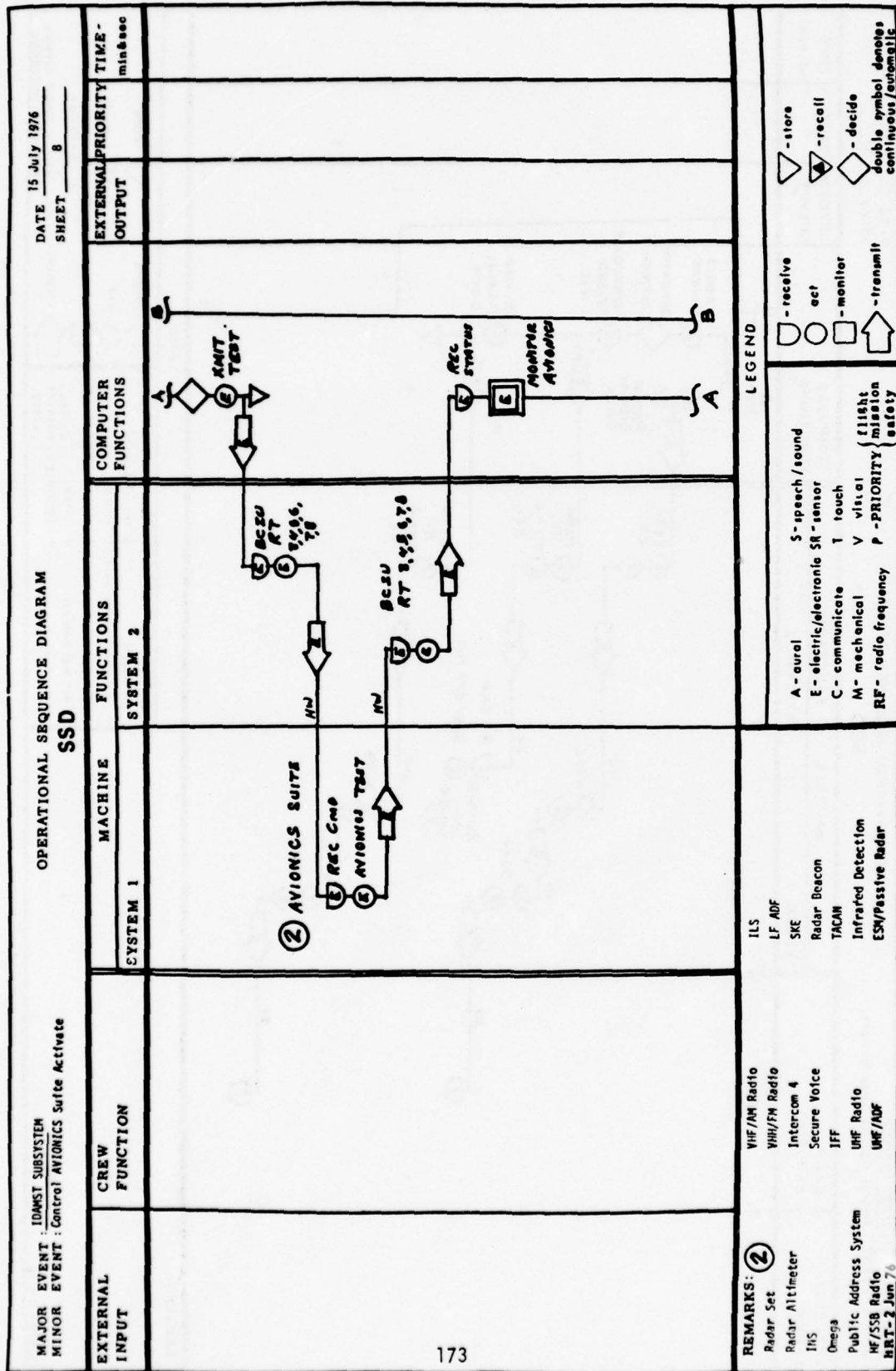


REMARKS: ①

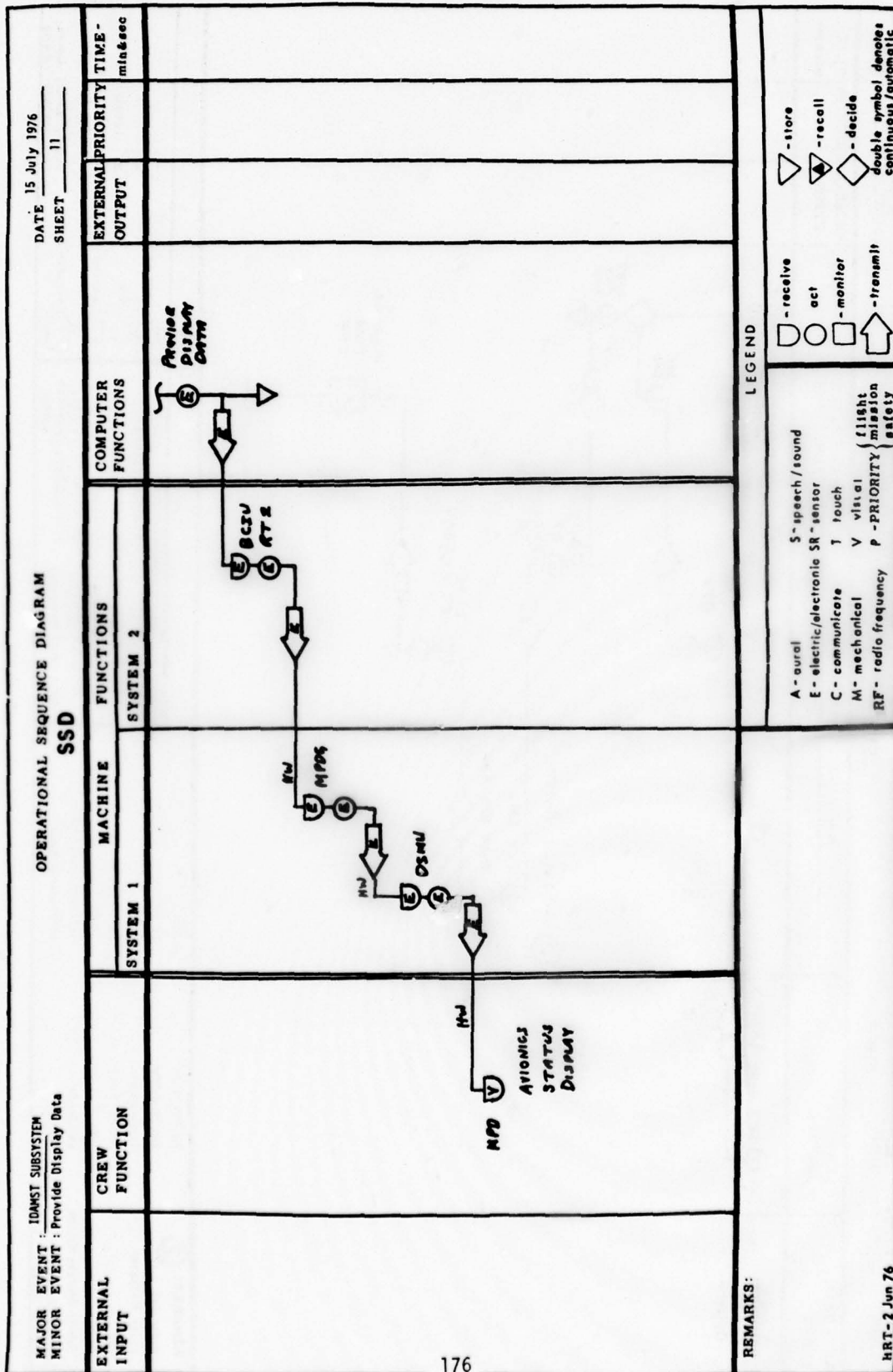
PRELUCE
 TAKE OFF/CLIMB
 CRUISE
 REDES
 APPROACH
 DESCENT

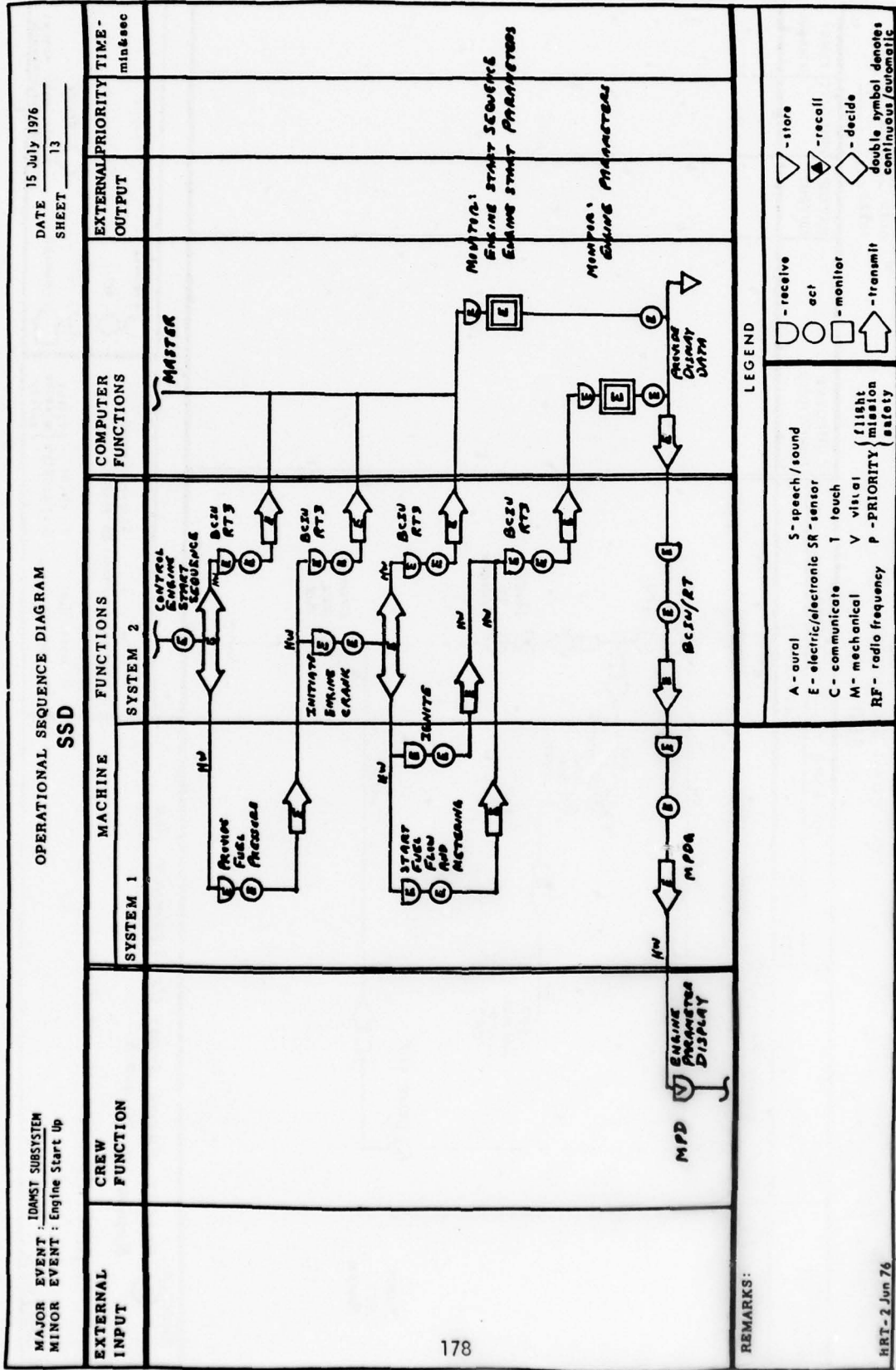
APPROACH/LANDING
 POST FLIGHT
 TEST PROGRAM

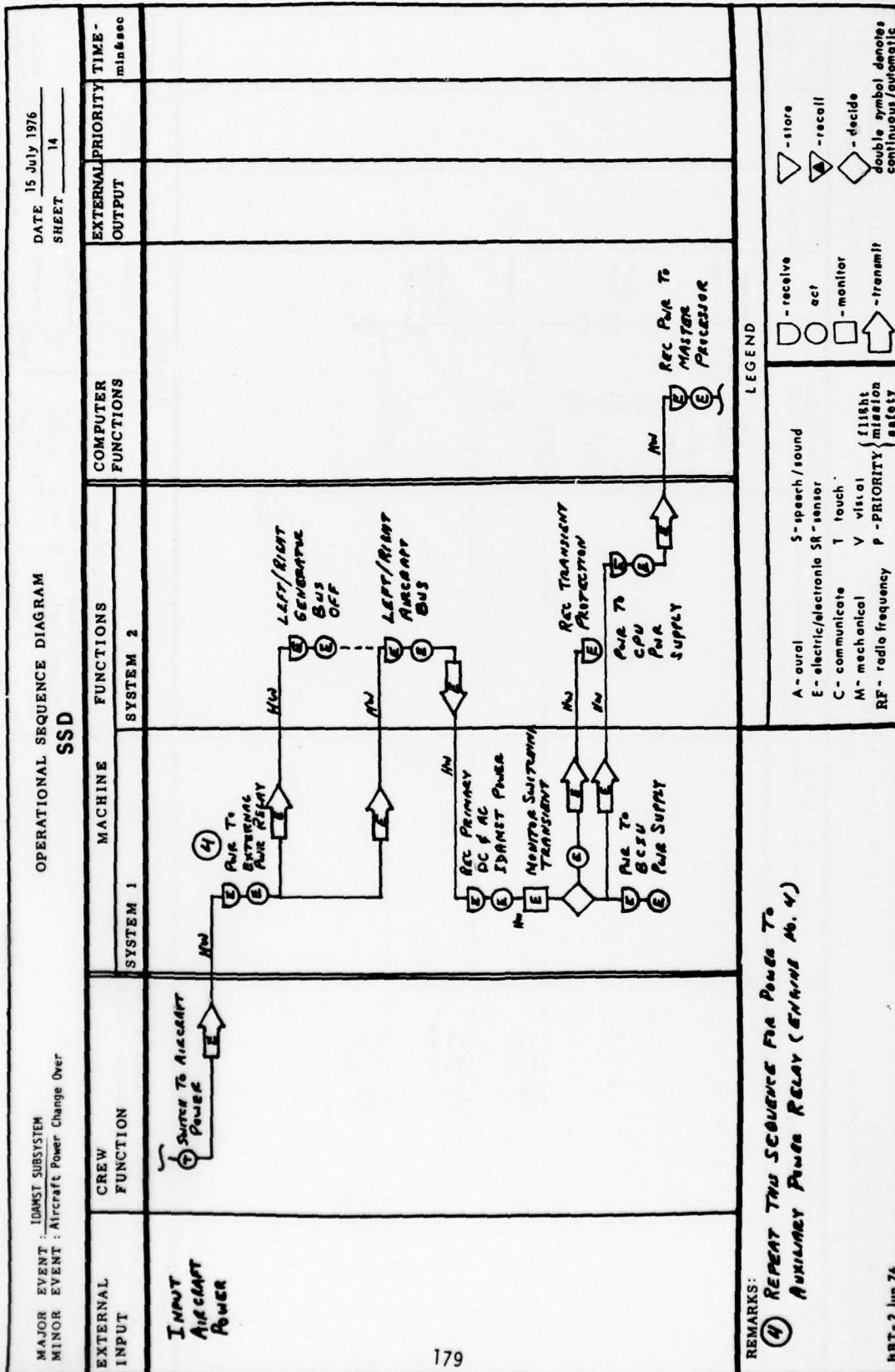




MAJOR EVENT : IDAMST SUBSYSTEM		DATE 15 July 1976				
MINOR EVENT : Control Avionics Suite Activate		SHEET 10				
OPERATIONAL SEQUENCE DIAGRAM						
SSD						
EXTERNAL INPUT	CREW FUNCTION	MACHINE		COMPUTER FUNCTIONS	EXTERNAL OUTPUT	TIME - min&sec
		SYSTEM 1	SYSTEM 2			
INVT Pilot Option	INVT (7) SWPT Down AVIONICS	N/A	BCU RT2	DESCRIBE AVIONICS NOT REQUIRED		
		② AVIONICS SUITE				
		REC CMO				
		TURN AIR OFF				
		BCU RT 3,4,5,6				
		BCU RT 3,4,5,6,7,8				
		Monitor PWR OFF				

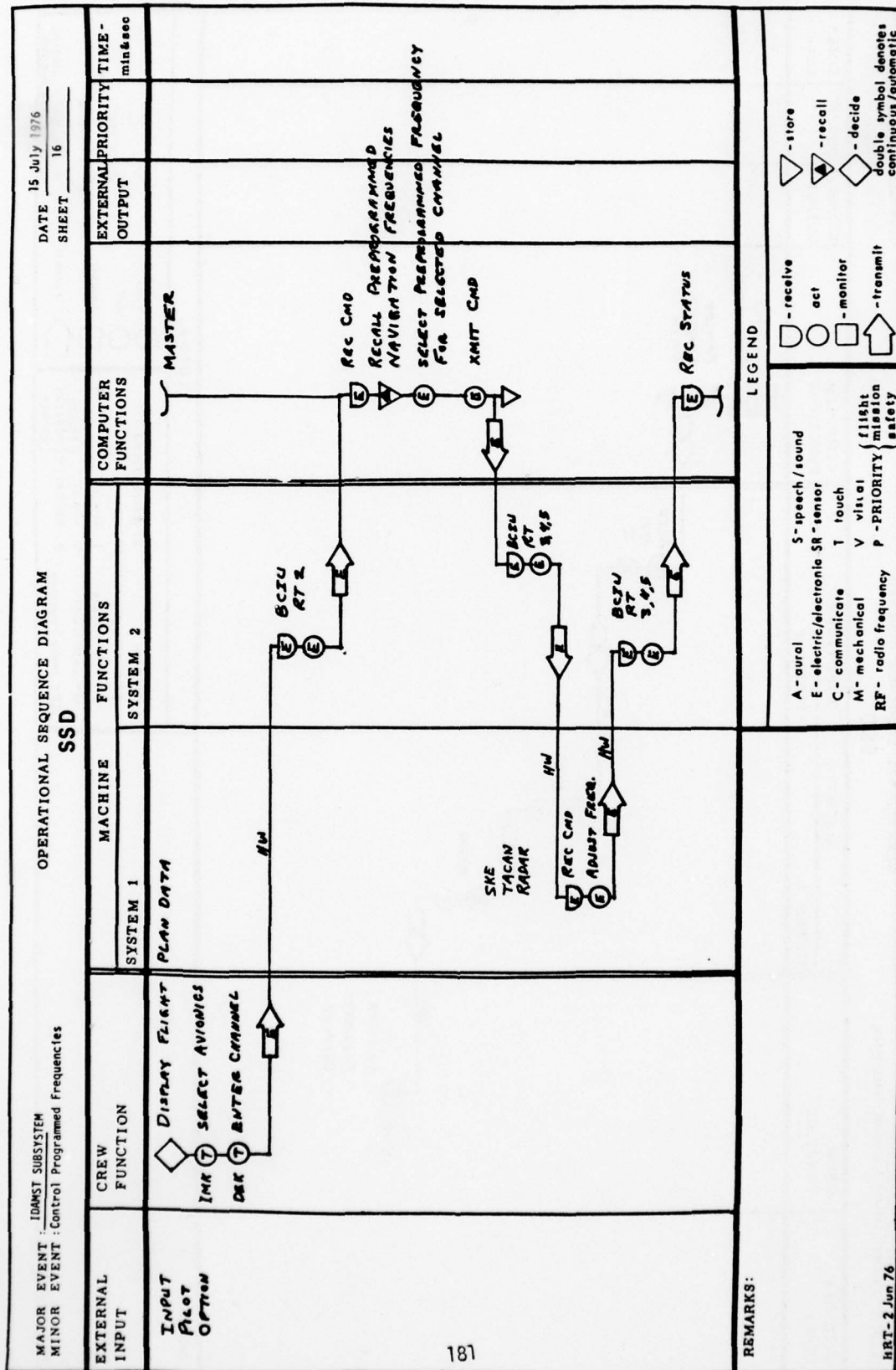


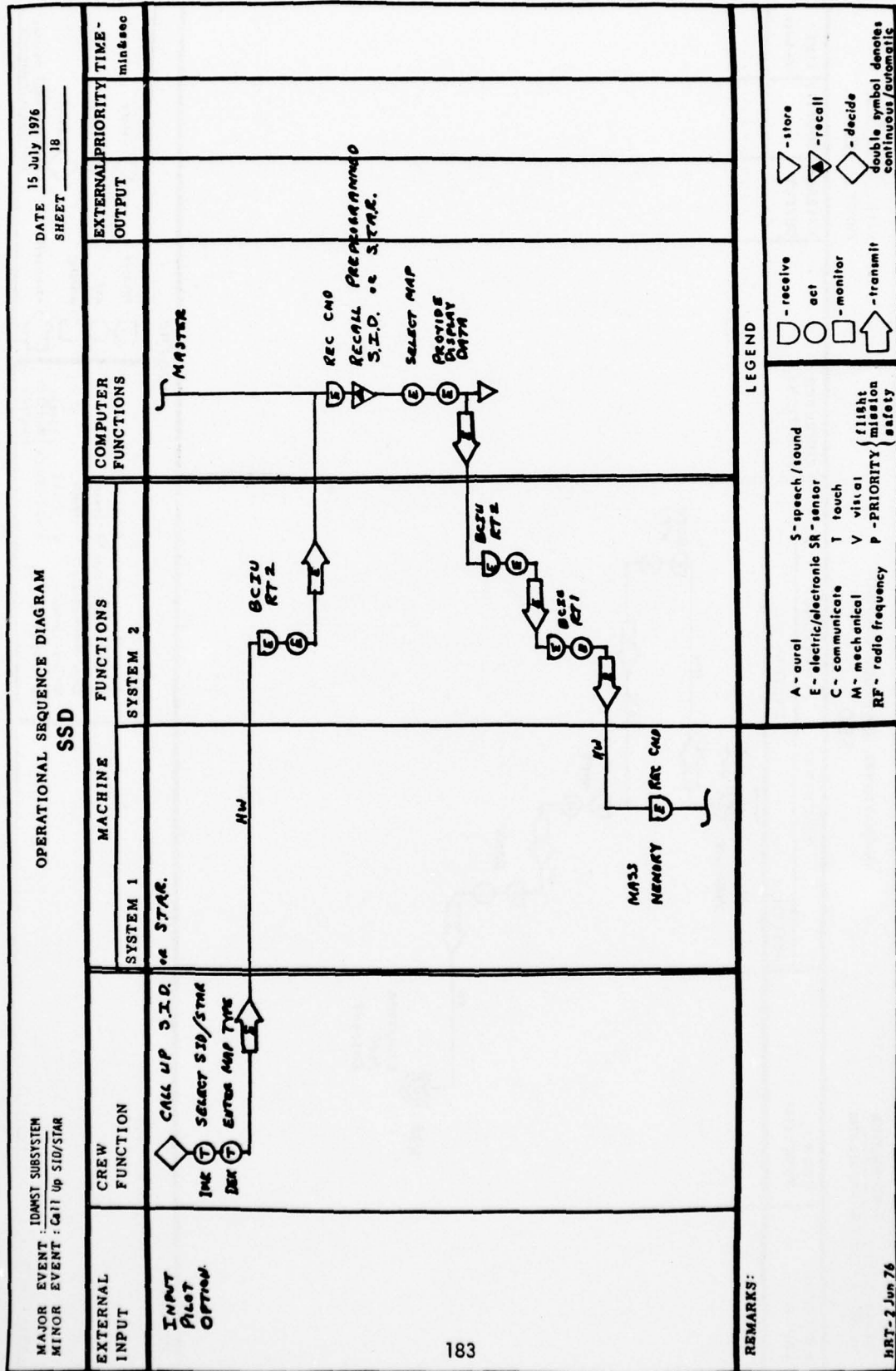




LEGEND

- | | | | |
|-------------------------|-----------------------|--------------|--|
| A - aural | S - speech / sound | □ - receive | △ - store |
| E - electric/electronic | SR - sensor | ○ - act | ▲ - recall |
| C - communicate | T - touch | □ - monitor | ◇ - decide |
| M - mechanical | V - visual | ↑ - transmit | double symbol denotes continuous/automatic |
| RF - radio frequency | P - PRIORITY | | |
| | flight mission safety | | |

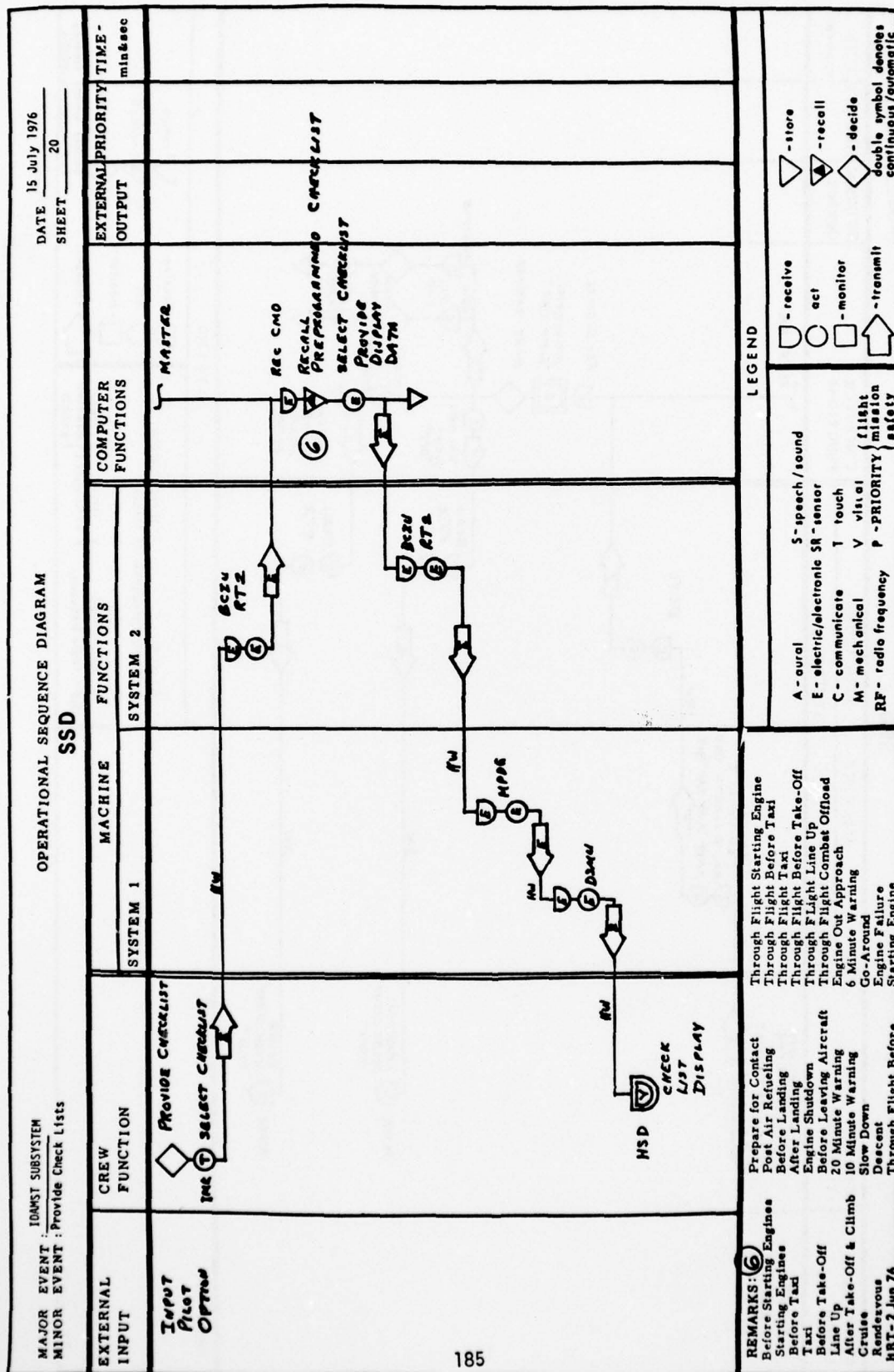




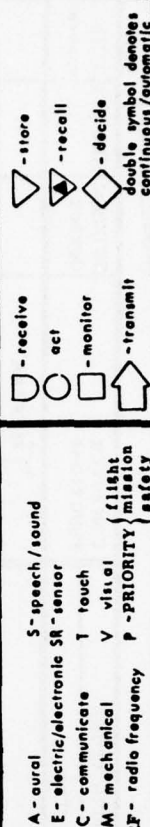
MAJOR EVENT : IDAMST SUBSYSTEM MINOR EVENT : Call Up SID/STAR		OPERATIONAL SEQUENCE DIAGRAM SSD					DATE 15 July 1976 SHEET 19
EXTERNAL INPUT	CREW FUNCTION	SYSTEM 1 MACHINE FUNCTIONS	SYSTEM 2 FUNCTIONS	COMPUTER FUNCTIONS	EXTERNAL OUTPUT	PRIORITY	TIME - min & sec
REMARKS:							

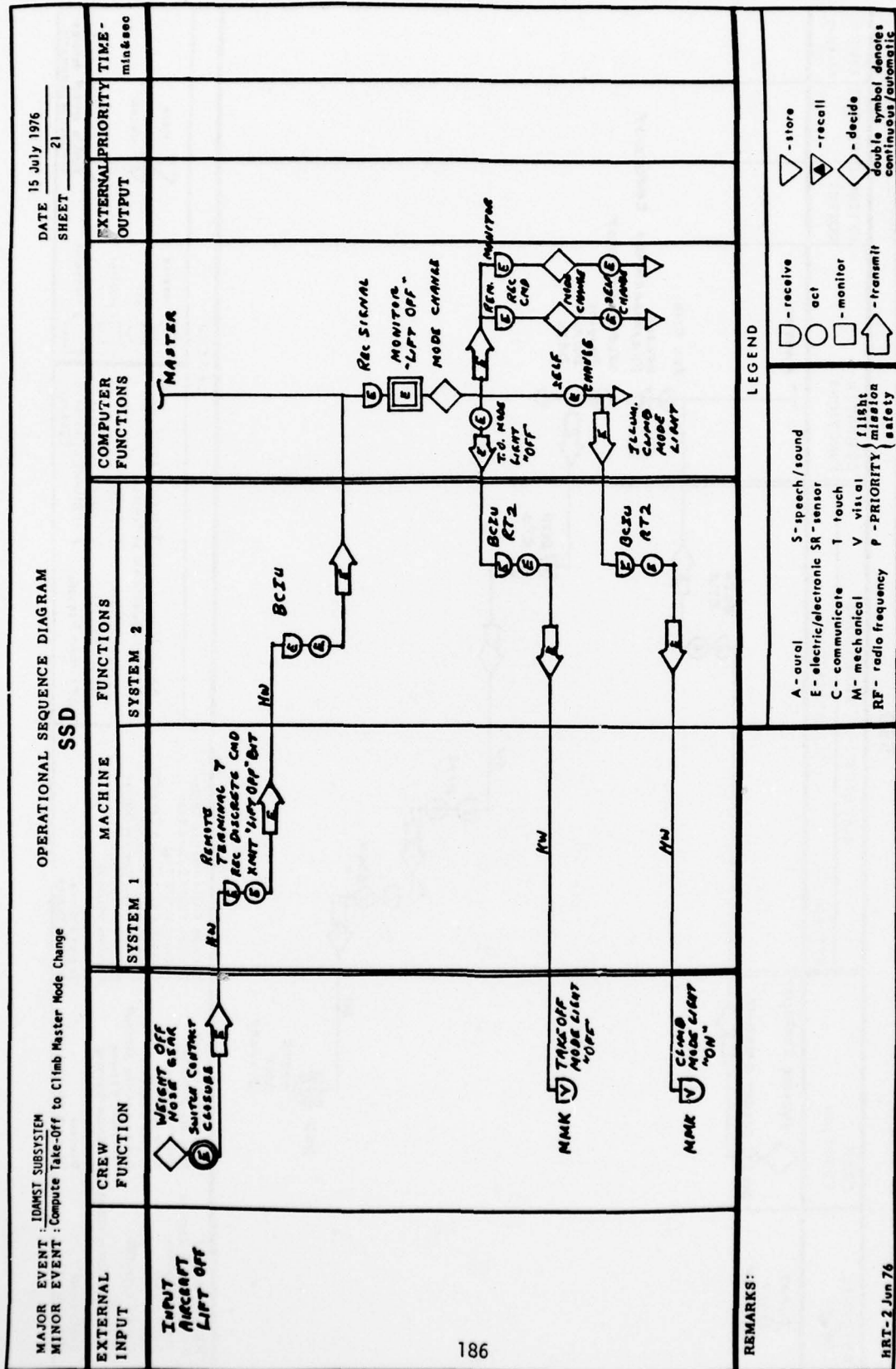
LEGEND

A - aural	S - speech / sound	□ - receive	△ - store
E - electric/electronic	SR - sensor	○ - act	▲ - recall
C - communicate	T - touch	□ - monitor	◇ - decide
M - mechanical	V - visual	↑ - transmit	double symbol denotes continuous/automatic
RF - radio frequency	P - PRIORITY		



LEGEND

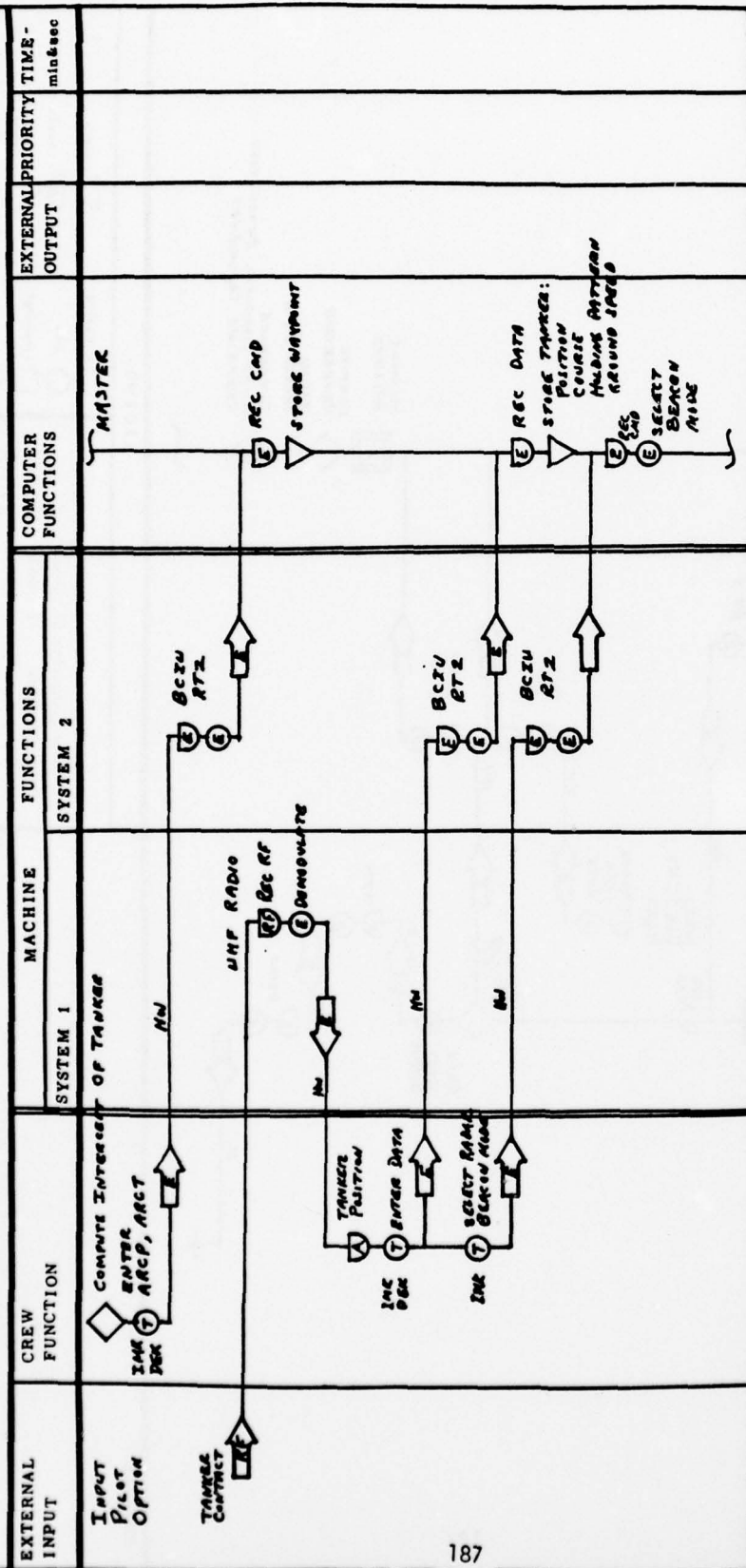




MAJOR EVENT : IDAMST SUBSYSTEM
MINOR EVENT : Compute Intercept of Tanker

OPERATIONAL SEQUENCE DIAGRAM SSD

DATE 15 July 1976
SHEET 22

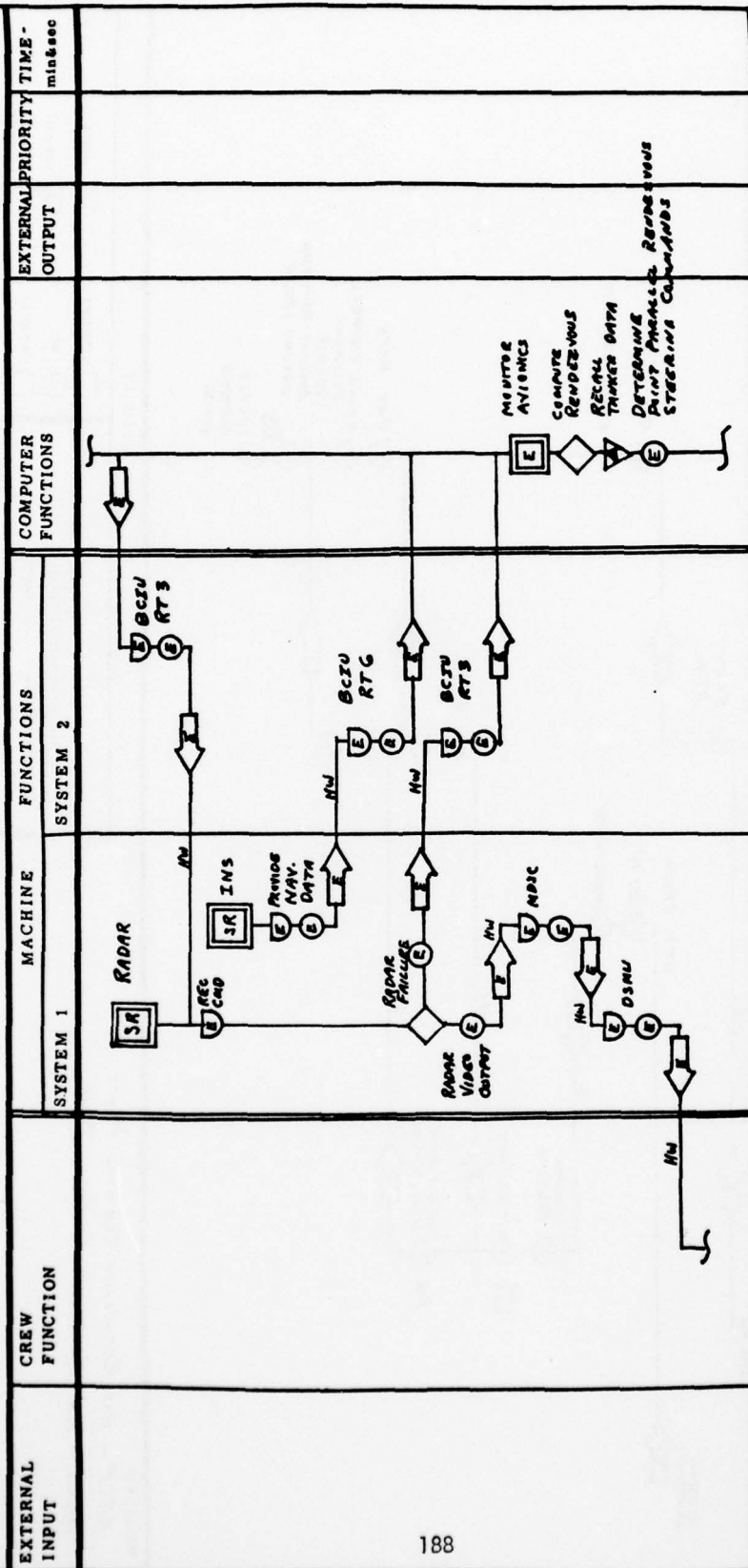


REMARKS:
ARCP - Air Refueling Control Point
ARCT - Air Refueling Control Time

LEGEND

- | | | |
|-------------------------|-----------------------|--|
| A - aural | S - speech / sound | △ - store |
| E - electric/electronic | SR - sensor | ◀ - recall |
| C - communicate | T - touch | ◊ - decide |
| M - mechanical | V - visual | double symbol denotes continuous/automatic |
| RF - radio frequency | P - PRIORITY | |
| | flight mission safety | |
| | | ◻ - transmit |




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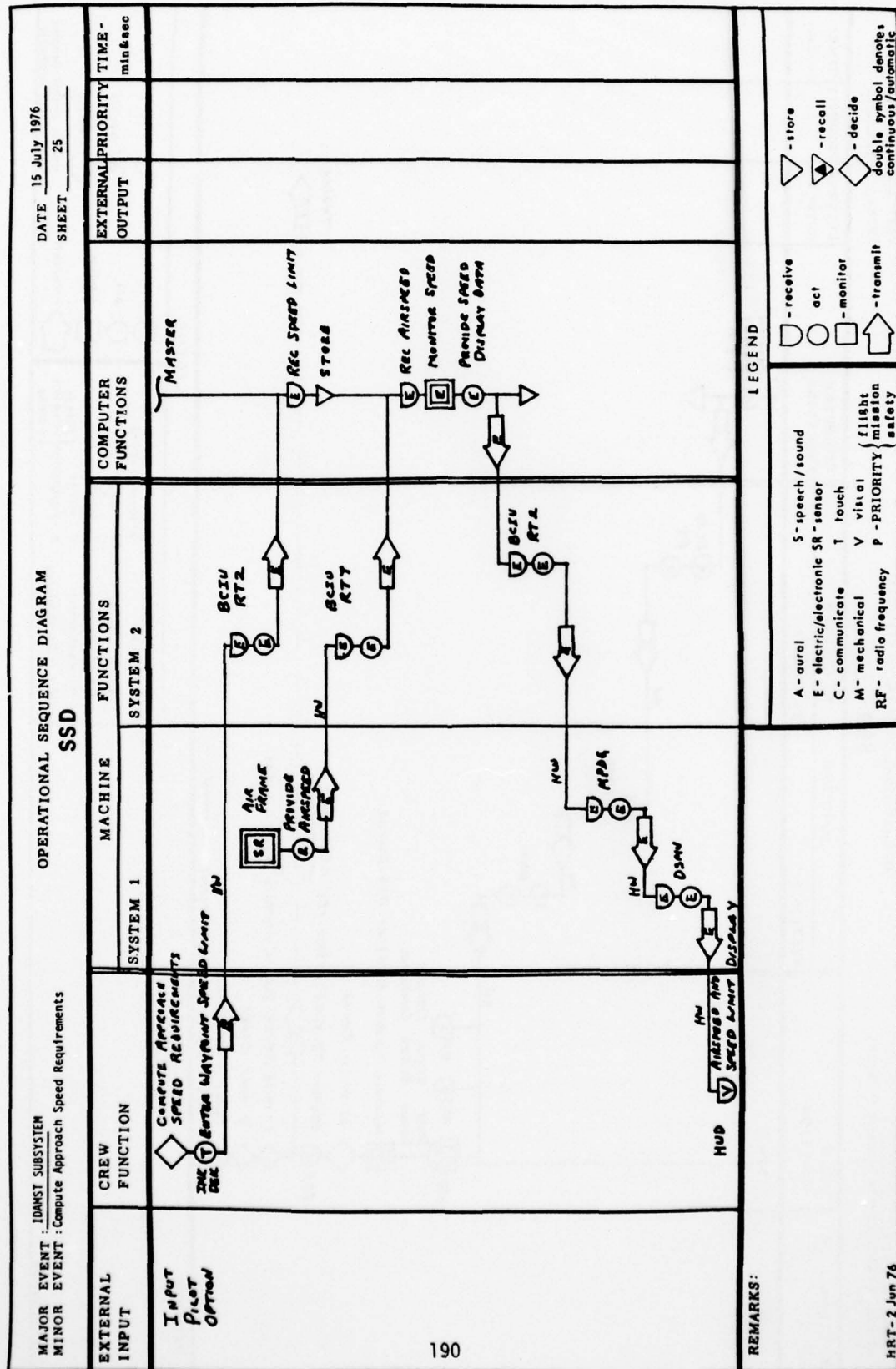
REMARKS:

LEGEND

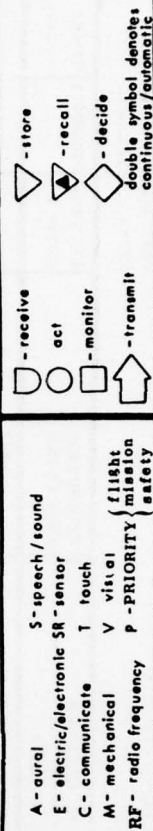
A - aural	S - speech / sound
E - electric/electronic	SR - sensor
C - communicate	T - touch
M - mechanical	V - visual
R - radio frequency	P - PRIORITY
	flight mission safety

 -store
 -recall
 -decide

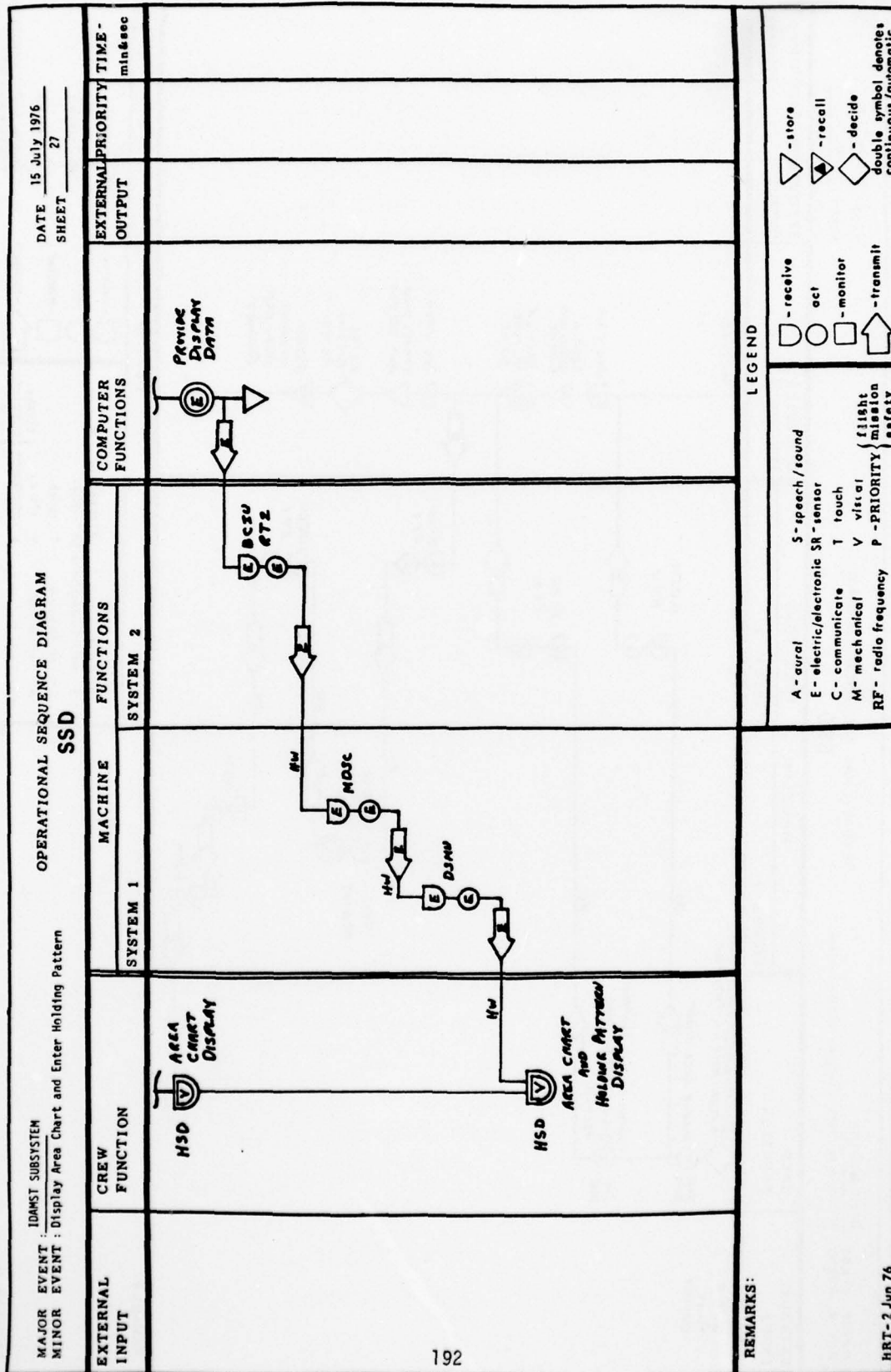
double symbol denotes continuous/automatic



LEGEND







LEGEND

A - aural
E - electric/electronic
C - communicate
M - mechanical
RF - radio frequency

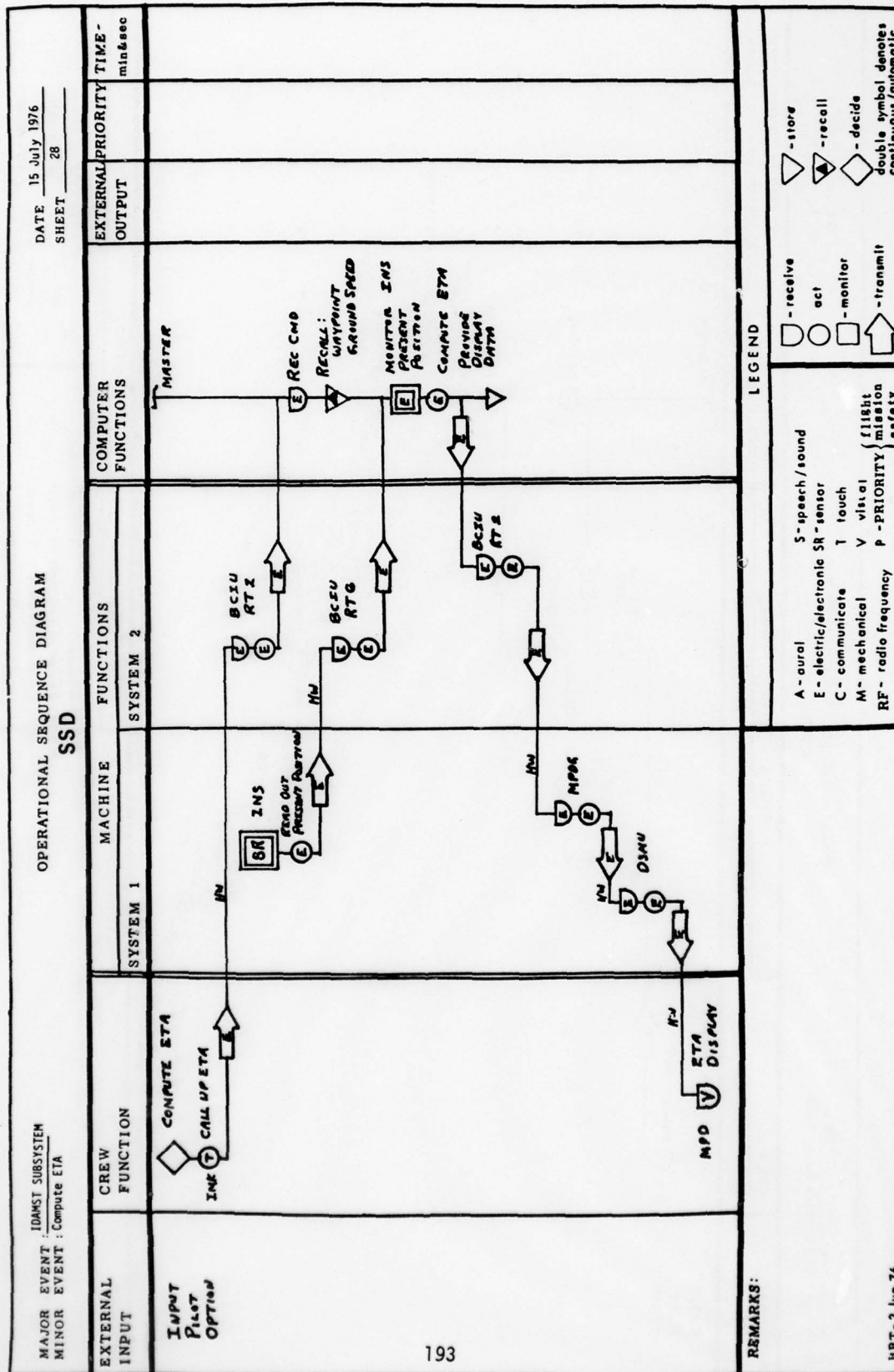
S - speech/sound
SR - sensor
T - touch
V - visual
P - PRIORITY

- store
- recall
- decide
double symbol denotes continuous/automatic

- receive
act
- monitor
- transmit

REMARKS:

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LEGEND

- A - aural
- E - electric/electronic
- C - communicate
- M - mechanical
- RF - radio frequency
- S - speech/sound
- SR - sensor
- T - touch
- V - visual
- P - PRIORITY
- flight mission safety
- ◇ - store
- ◇ - recall
- ◇ - decide
- double symbol denotes continuous/automatic
- - receive
- - act
- - monitor
- ↑ - transmit

AD-A045 596

DOUGLAS AIRCRAFT CO LONG BEACH CA GOVERNMENT AVIONIC--ETC F/G 1/3
SPECIFICATIONS FOR IDAMST SOFTWARE. VOLUME II. APPENDICES.(U)

JUL 77 A CHAMBERLAIN, F J DILLON, F H KISHI F33615-76-C-1297

UNCLASSIFIED

MDC-J7271-VOL-2

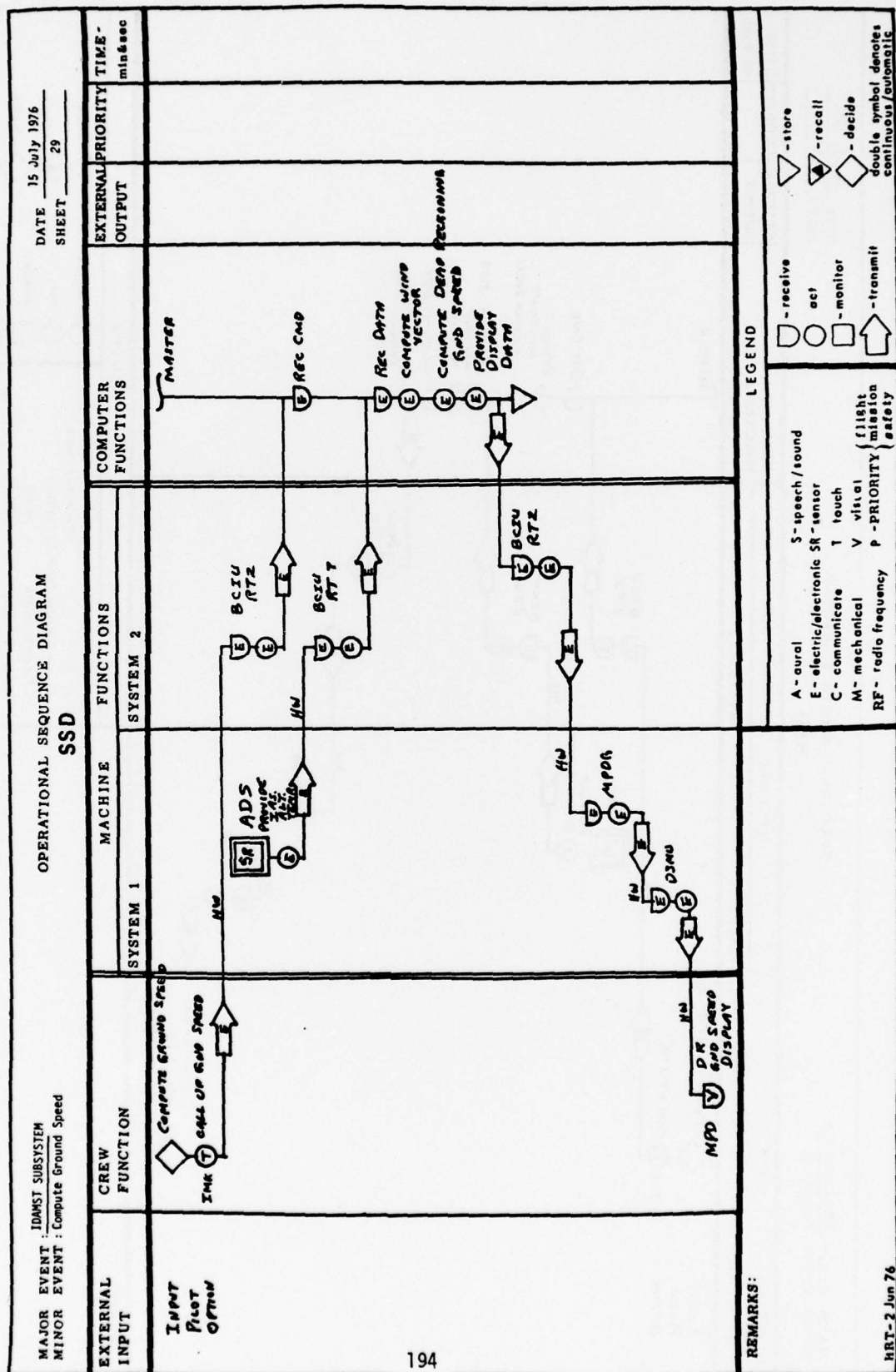
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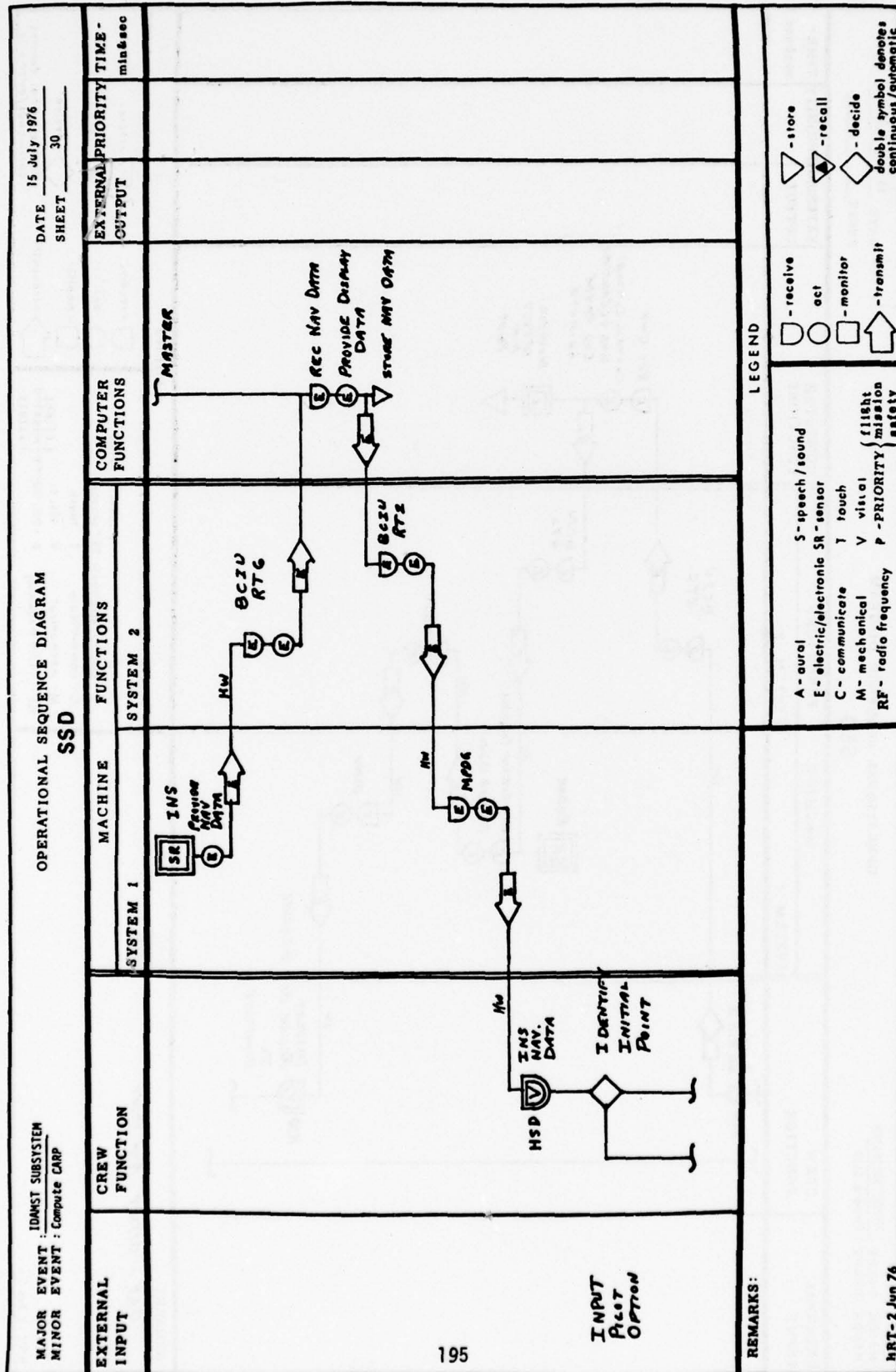
NL

3 of 4

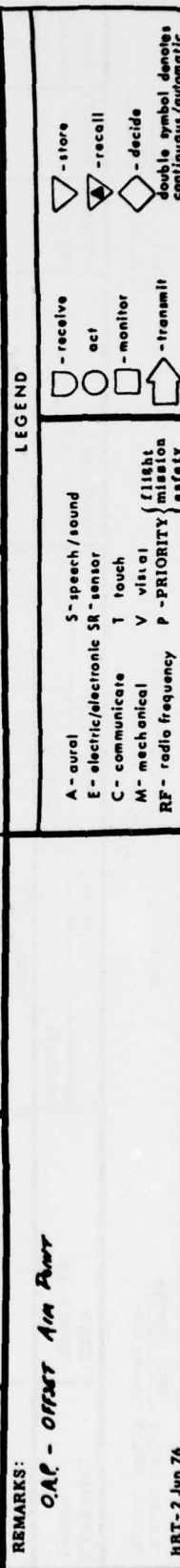
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OPERATIONAL SEQUENCE DIAGRAM



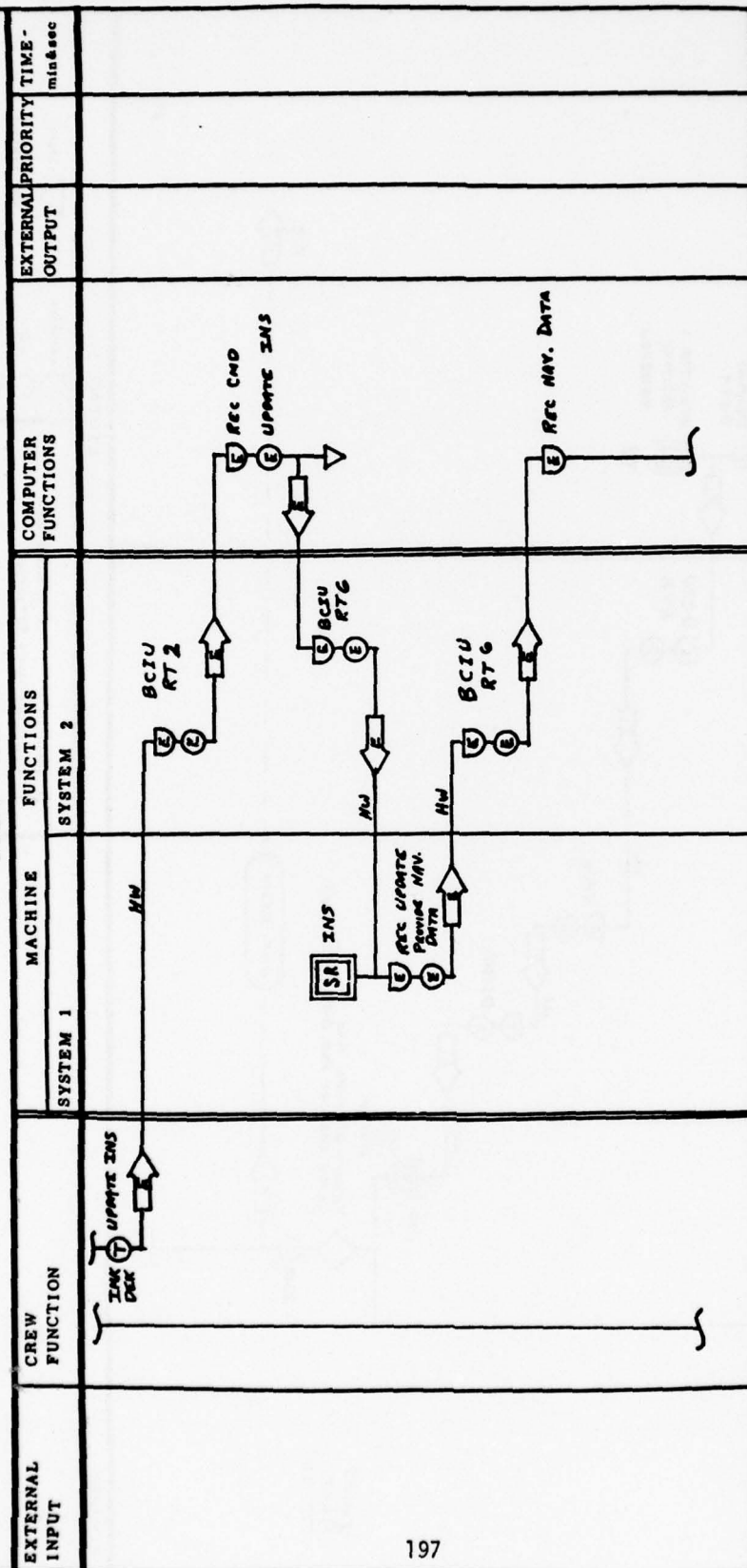
OAP - OFFSET A/M DWT

HRT-2 Jun 76

MAJOR EVENT : IDWST SUBSYSTEM
MINOR EVENT : Compute CARP

OPERATIONAL SEQUENCE DIAGRAM SSD

DATE 15 July 1976
SHEET 32



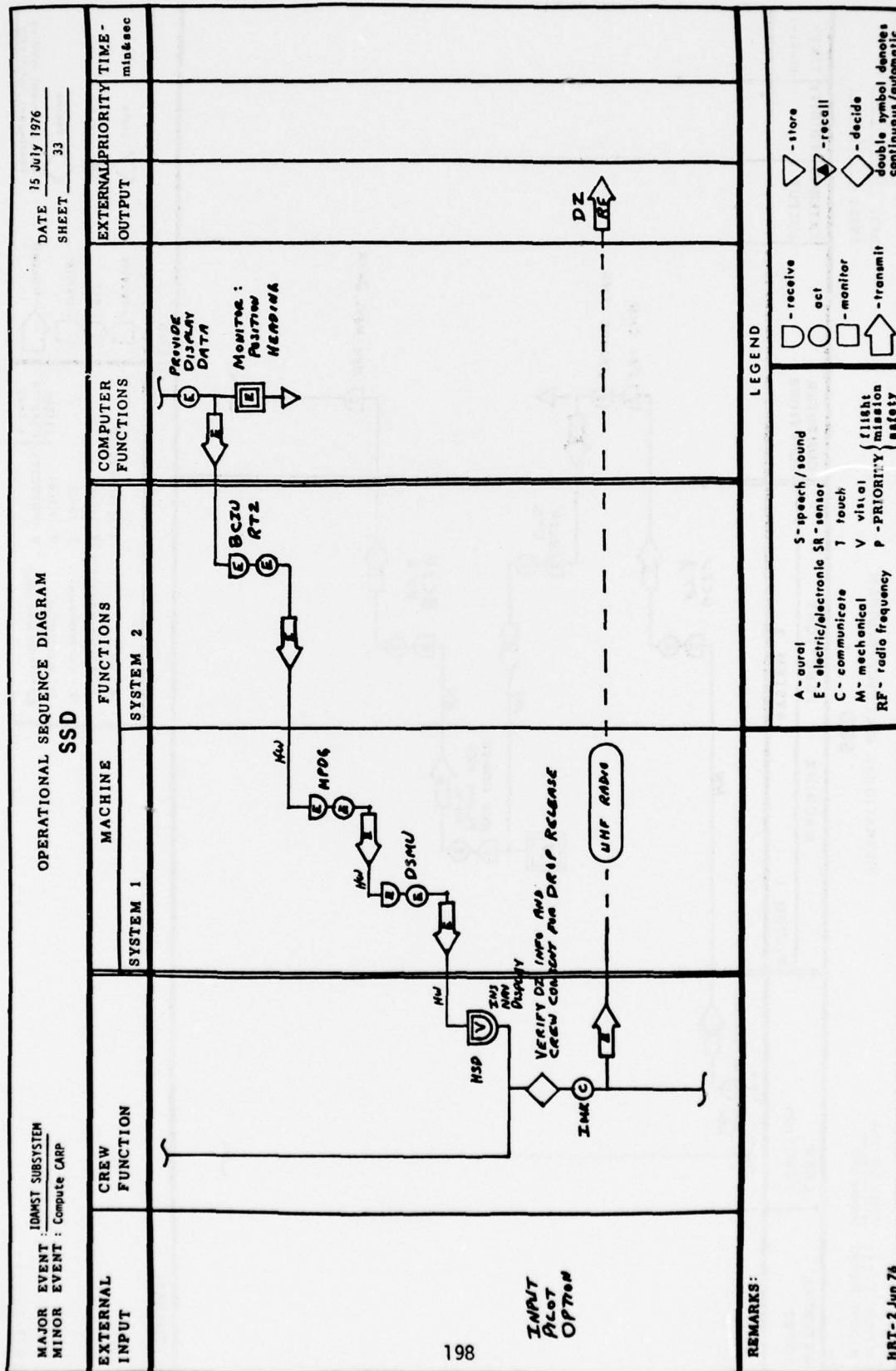
REMARKS:

LEGEND

A - aural
 E - electric/electronic
 C - communicate
 M - mechanical
 RF - radio frequency

S - speech / sound
 SR - sensor
 T - touch
 V - visual
 P - PRIORITY

- receive
 - store
 - recall
 - monitor
 - decide
 double symbol denotes continuous/automatic



APPENDIX C

TO

FINAL TECHNICAL REPORT

FOR

AFAL CONTRACT NUMBER F33615-76-C-1297

IDAMST INTEGRATED MULTI-FUNCTION

KEYBOARD SAMPLE MESSAGES

The IMFK is visualized as a programmable alpha-numeric display combined with some pushbutton switches. In some display systems it would be called the menu selector. The alpha-numeric part involves ten lines that are 30 characters long, arranged in three columns. The side switches are named key 1 through key 10. The top 8 switches are named as shown and are used for specific function selection. All of the switches are of the push-on, push-off appearance as viewed by the operator. There are to be two panels, one for each operator.

Master Mode Operations. The selection of any master mode push button immediately puts a set of ten 20 character messages on the two IMFK's. For instance, pushing PREFLT, brings the messages shown in Figure C-1. Note that the avionics and computers have been previously turned on and a mission tape loaded to get this set of messages. An arrow is shown indicating that K1 must be pushed on and pushed off to check computer activation. Avionics is handled similarly. When the arrow moves to K3, pushing K3 on displays a set of status and setpoint statements on the MPD. These may be modified using the DEK. If the statements are acceptable, pushing K3 off moves the arrow to K4. This process can continue through K9. As the arrow moves opposite to K10, the key K10 is pushed on. If it is desired to skip pages 2 through 5 in the preflight checklist which mainly deal with aircraft systems, the number 6 is entered on the DEK and K10 is pushed off moving to page 6 of the checklist. If it is desired to continue on to page 2, simply operating K10 to off will accomplish this. There is provision for 10 pages of 10 messages each for each of the 9 master modes. Thus 900 messages must be stored exclusive of the MPD's.

Specific Function Operations. There are three specific function (brute force) operations possible, any one of which can override any master mode selection. These are the Systems Specific Function, the Checklist Specific Function, and Reconfiguration Specific Function. These functions are selected by the switches over the IMFK except for Reconfiguration which uses the PCP switch. There is provision for 60 pages of 10 messages each for all three specific functions. Some of these are cross-paginations and repeats, so that 530 of the 600 possible messages are assigned using 30 pages of data. Details of these pages are shown in this Appendix.

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE	PRE FLT
PAGE NUMBER	PI
PAGE NAME	TURN-ON

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK	
K1 →	COMPUTERS ACTIVATED					CHK HUD	STDBY RET		← K6
K2 →	AVIONICS ACTIVATED					CHK HUD	CRUISE IMG		← K7
K3 →	INS ALIGN MSG ON MPD					CHK HUD	SPEC IMG		← K8
K4 →	LAT LONG MSG ON MPD					CHK HUD	APPR IMG		← K9
K5 →	MAG VAR MSG ON MPD					SKP PGS 2 - 5			← K10

FIGURE C-1 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE PRE FLT
PAGE NUMBER P2
PAGE NAME COMM SET

INTEGRATED MULTI-FUNCTION KEYBOARD

COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK
K1 →	CHG HF/SSB MSG ON MPD				CHK SEC VOICE		← K6
K2 →	CHG VHF/AM MSG ON MPD				CHK PA SYS		← K7
K3 →	CHG VHF/FM MSG ON MPD				CHK INTERPHONE		← K8
K4 →	CHG UHF/#1 MSG ON MPD				SET TACAN MSG ON MPD		← K9
K5 →	CHG UHF/#2 MSG ON MPD				SET RADAR MSG ON MPD		← K10

FIGURE C-2 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE REFUEL	
		AIR DROP	
TEST		DESC	APPR LAND
			POST FLIGHT

MASTER MODE	PRE FLT
PAGE NUMBER	P3
PAGE NAME	NAV SET

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK
K1 →	CHK TACAN MSG ON MPD					CHK AHRS MSG ON MPD		← K6
K2 →	CHK ILS #1 MSG ON MPD					CHK OMEGA MSG ON MPD		← K7
K3 →	CHK ILS #2 MSG ON MPD					SELECT SID		← K8
K4 →	CHK ADF HF MSG ON MPD					FUTURE NAV		← K9
K5 →	CHK ADF MSG ON MPD					FUTURE NAV		← K10

FIGURE C-4 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL
		AIR DROP	
TEST		DESC	APPR LAND
			POST FLIGHT

MASTER MODE PRE FLT
PAGE NUMBER P5
PAGE NAME POS SET

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK
K1 →	CHK RADAR MSG ON MPD	---	---	---	---	CHG BARO ALT MSG ON MPD	---	← K6
K2 →	CHK R ALTS MSG ON MPD	---	---	---	---	CHK AIR DATA MSG ON MPD	---	← K7
K3 →	CHK R BCN MSG ON MPD	---	---	---	---	CHK DFCS MSG ON MPD	---	← K8
K4 →	CHK SKE MSG ON MPD	---	---	---	---	FUTURE POS	---	← K9
K5 →	CHK IFF MSG ON MPD	---	---	---	---	FUTURE POS	---	← K10

FIGURE C-4 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE REFUEL	
		AIR DROP	
TEST		DESC	APPR LAND
			POST FLIGHT

MASTER MODE PRE FLT
PAGE NUMBER P4
PAGE NAME DISPL. CHK

INTEGRATED MULTI-FUNCTION KEYBOARD

COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK
K1 →	CHK HSD NORTH UP				CHK STDBY INS		← K6
K2 →	CHK HSD TRACK UP				ENG START MSG ON MPD		← K7
K3 →	CHK MPD 1 MSG ON MPD				CHK SURF. DISPL		← K8
K4 →	CHK MPD 2 MSG ON MPD				SPARE		← K9
K5 →	CHK MPD 3 MSG ON MPD				SPARE		← K10

FIGURE C-5 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE PRE FLT
PAGE NUMBER P6
PAGE NAME SYS. CHK 1

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK
K1 →	CHK FUEL MSG ON MPD					CHK ELECTR MSG ON MPD		← K6
K2 →	CHK LOX MSG ON MPD					CHK RAT MSG ON MPD		← K7
K3 →	CHK HYDR. MSG ON MPD					CHK A/R DOOR		← K8
K4 →	CHK WING CONFIG.					CHK PRESS MSG ON MPD		← K9
K5 →	CHK TRIM MSG ON MPD					CHK ANTI/SKID		← K10

FIGURE C-6 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE	PRE FLT
PAGE NUMBER	P7
PAGE NAME	SYS. CHK 2

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK
K1 →	CHK DE ICE MSG ON MPD					CHK ALL DR MSG ON MPD		← K6
K2 →	CHK PITOT MSG ON MPD					CHK PNEU		← K7
K3 →	CHK DEFOG MSG ON MPD					CHK ENG CONT		← K8
K4 →	CHK E/R MSG ON MPD					CHK.SW.SET MSG ON MPD		← K9
K5 →	CHK TH REV MSG ON MPD					RETURN TO P K		← K10

FIGURE C-7 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE REFUEL	
		AIR DROP	
TEST		DESC	APPR LAND
			POST FLIGHT

MASTER MODE PRE FLT

PAGE NUMBER P8

PAGE NAME MISSION

INTEGRATED MULTI-FUNCTION KEYBOARD

COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK
K1 →	DISPL DATE MSG ON MPD	---	---	---	DISPL FUEL MSG ON MPD	---	← K6
K2 →	DISPL TIME MSG ON MPD	---	---	---	CHK CONTR MSG ON MPD	---	← K7
K3 →	DISPL DATA MSG ON MPD	---	---	---	CHK BRAKES	---	← K8
K4 →	DISPL STAT MSG ON MPD	---	---	---	CHK PRESS	---	← K9
K5 →	DISPL CG MSG ON MPD	---	---	---	CHK LIGHTS	---	← K10

FIGURE C-8 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE	PRE FLT
PAGE NUMBER	P9
PAGE NAME	WAYPOINT

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK
K1 →	CHK W/P #1 MSG ON MPD	---	---	---	---	CHK W/P #6 MSG ON MPD	---	← K6
K2 →	CHK W/P #2 MSG ON MPD	---	---	---	---	CHK W/P #7 MSG ON MPD	---	← K7
K3 →	CHK W/P #3 MSG ON MPD	---	---	---	---	CHK W/P #8 MSG ON MPD	---	← K8
K4 →	CHK W/P #4 MSG ON MPD	---	---	---	---	CHK W/P #9 MSG ON MPD	---	← K9
K5 →	CHK W/P #5 MSG ON MPD	---	---	---	---	CHK W/P #10 MSG ON MPD	---	← K10

FIGURE C-9 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE PREFLT

PAGE NUMBER P10

PAGE NAME RUNWAY

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK
K1 →	CHK LENGTH MSG ON MPD					CHK GR WT MSG ON MPD		← K6
K2 →	CHK RW HDG MSG ON MPD					CHK TEMP MSG ON MPD		← K7
K3 →	CHK RCR MSG ON MPD					DISPL ATT ON HUD		← K8
K4 →	CHK WIND MSG ON MPD					DISPL SID ON HSD		← K9
K5 →	CHK RW SLP MSG ON MPD					INS GO MSG ON MPD		← K10

FIGURE C-10 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE TAKE OFF
PAGE NUMBER P11
PAGE NAME FINAL SET

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK
K1 →	COMM CHG MSG ON MPD					READ IAS MSG ON MPD		← K6
K2 →	TCN CHG MSG ON MPD					READ TA S MSG ON MPD		← K7
K3 →	CMD HDG MSG ON MPD					READ GND SPD MSG ON MPD		← K8
K4 →	ALT SET MSG ON MPD					READ GND SPD MSG ON MPD		← K9
K5 →	IFF CHG MSG ON MPD					MONITOR THRUST		← K10

FIGURE C-11 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE TAKE OFF

PAGE NUMBER P12

PAGE NAME THRUST

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK
K1 →	THRUST MON. ON HUD					CHK HI LIFT MSG ON MPD		← K6
K2 →	CRIT. VAR. ON HUD					CLIMB PROF ON DISPL		← K7
K3 →	CHK ACCEL ON HUD					DISPL SID ON HSD		← K8
K4 →	CHK ROTAT ON HUD					ANTI-SKID OFF		← K9
K5 →	CHK T/O ON HUD					CLIMB		← K10

FIGURE C-12 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE TAKE OFF
PAGE NUMBER P13
PAGE NAME CHK & W/P

INTEGRATED MULTI-FUNCTION KEYBOARD

COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK
K1 →	ANTI SKID ON MSG ON MPD				ADD W/P MSG ON MPD		← K6
K2 →	GEAR UP MSG ON MPD				DELETE W/P MSG ON MPD		← K7
K3 →	FLAPS UP MSG ON MPD				CLIMB ALONE		← K8
K4 →	CHK M WARN MSG ON MPD				CLIMB SKE		← K9
K5 →	SELECT W/P ENTER NO. & K5				SPARE		← K10

FIGURE C-13 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE TAKE OFF
PAGE NUMBER P14
PAGE NAME CLIMB ALONE

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK	
K1 →	COMM CHG MSG ON MPD					AUTO HDG MSG ON MPD			← K6
K2 →	TCN CHG MSG ON MPD					ATT HOLD MSG ON MPD			← K7
K3 →	IFF CHG MSG ON MPD					CRS CHG MSG ON MPD			← K8
K4 →	WX RADAR ON HSD					ATT DISPL ON HUD			← K9
K5 →	NAV DATA ON HSD					RET TO CHK			← K10

FIGURE C-14 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE TAKE OFF

PAGE NUMBER P15

PAGE NAME CLIMB SKE

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK
K1 →	COMM CHG MSG ON MPD					SKE ON HSD		← K6
K2 →	TCN CHG MSG ON MPD					ATT HOLD MSG ON MPD		← K7
K3 →	IFF CHG MSG ON MPD					CRS CHG MSG ON MPD		← K8
K4 →	WX RADAR ON HSD					ATT DISPL. ON HUD		← K9
K5 →	NAV DATA ON HSD					RET TO CHK		← K10

FIGURE C-15 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE CRUISE
 PAGE NUMBER P21
 PAGE NAME CHK & W/P

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK
K1 →	CHK M WARN MSG ON MPD					ADD W/P MSG ON MPD		← K6
K2 →	CHK DEFOG MSG ON MPD					DELETE W/P MSG ON MPD		← K7
K3 →	CHK DE ICE MSG ON MPD					CRUISE ALO		← K8
K4 →	CHK PITOT MSG ON MPD					CRUISE SKE		← K9
K5 →	SELECT W/P MSG ON MPD					CRUISE GPS		← K10

FIGURE 6-16 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE REFUEL	
		AIR DROP	
TEST		DESC	APPR LAND
			POST FLIGHT

MASTER MODE CRUISE
PAGE NUMBER P22
PAGE NAME CRUISE ALONE

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK	
K1 →	COMM CHG MSG ON MPD					AUTO HDG MSG ON MPD			← K6
K2 →	TCN CHG MSG ON MPD					CRS. HOLD MSG ON MPD			← K7
K3 →	IFF /BEAC MSG ON MPD					CHK PRESS MSG ON MPD			← K8
K4 →	RADAR ON HSD					ALT/ATT ON HUD			← K9
K5 →	NAV DATA ON HSD					RET TO CHK			← K10

FIGURE C-17 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE REFUEL	
		AIR DROP	
TEST		DESC	APPR LAND
			POST FLIGHT

MASTER MODE CRUISE
PAGE NUMBER P23
PAGE NAME CRUISE SKE

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK
K1 →	COMM CHG MSG ON MPD TCN CHG					SKE DATA ON HSD		← K6
K2 →	MSG ON MPD					CRS. HOLD MSG ON MPD		← K7
K3 →	IFF/BEAC MSG ON MPD					CHK PRESS MSG ON MPD		← K8
K4 →	RADAR ON HSD					ALT/ATT ON HUD		← K9
K5 →	NAV DATA ON HSD					RET TO CHK.		← K10

FIGURE C-18 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE CRUISE
PAGE NUMBER P24
PAGE NAME CRUISE GPS

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK
K1 →	COMM CHG MSG ON MPD					GPS DATA ON HSD		← K6
K2 →	TCN CHG MSG ON MPD					CRS HOLD MSG ON MPD		← K7
K3 →	IFF/BEAC MSG ON MPD					CHK PRESS MSG ON MPD		← K8
K4 →	RADAR ON HSD					ALT/ATT ON HUD		← K9
K5 →	NAV DATA ON HSD					RET TO CHK.		← K10

FIGURE C-19 - IMFK MESSAGES

MASTER MODE KEYBOARD

MASTER MODE RE FUEL
PAGE NUMBER P31
PAGE NAME CHK

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL
		AIR DROP	
TEST		DESC	APPR LAND
			POST FLIGHT

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK
K1 →	COMM CHG MSG ON MPD					CHK M WARN MSG ON MPD		← K6
K2 →	CHK BEACON MSG ON MPD					DFCS STAT MSG ON MPD		← K7
K3 →	CHK A/R DR MSG ON MPD					CHK VALVES MSG ON MPD		← K8
K4 →	CHK TRIM MSG ON MPD					SPARE		← K9
K5 →	CHK SPEED MSG ON MPD					LOAD		← K10

FIGURE C-20 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE	RE FUEL
PAGE NUMBER	P32
PAGE NAME	LOAD

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK
K1 →	COMM CHG MSG ON MPD					CHK M WARN MSG ON MPD		← K6
K2 →	CHK BEACON MSG ON MPD					DFCS STAT MSG ON MPD		← K7
K3 →	SKE DATA ON HSD					CHK VALVES MSG ON MPD		← K8
K4 →	FUEL STAT MSG ON MPD					RETURN TO REF CHK		← K9
K5 →	SPARE					RETURN TO CRUISE		← K10

FIGURE C-21 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE AIR DROP
PAGE NUMBER P41
PAGE NAME CHK

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK
K1 →	CHK M WARN MSG ON MPD					DROP TIME MSG ON MPD		← K6
K2 →	CHK HI LIFT MSG ON MPD					DOORS STAT MSG ON MPD		← K7
K3 →	CHK ALT VEL ON HUD					IFF/BEAC MSG ON MPD		← K8
K4 →	CHK PRESS MSG ON MPD					SPARE		← K9
K5 →	CHK ESM MSG ON MPD					SET CARP		← K10

FIGURE C-22 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE AIR DROP
PAGE NUMBER P42
PAGE NAME CARP.

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK	
K1 →	CARP LA/LG MSG ON MPD					ALT/VEL MSG ON MPD			← K6
K2 →	D2 DIMENS MSG ON MPD					TEMP/PRESS MSG ON MPD			← K7
K3 →	PARCT VEL MSG ON MPD					DROP ALONE			← K8
K4 →	PARCT RATE MSG ON MPD					DROP SKE			← K9
K5 →	OFFSET MSG ON MPD					DROP LAPES			← K10

FIGURE C-23 - IMFK MESSAGES

MASTER MODE KEYBOARD

MASTER MODE AIR DROP
 PAGE NUMBER P43
 PAGE NAME DROP ALONE

PRE FLIGHT	T/O CLIMB	CRUISE REFUEL	
		AIR DROP	
TEST		DESC	APPR LAND
			POST FLIGHT

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK	
K1 →	COMM CHG MSG ON MPD					DROP TIME MSG ON MPD			← K6
K2 →	CARP DATA ON HSD					CHK HI LIFT MSG ON MPD			← K7
K3 →	RADAR DATA ON HSD					LOAD STAT MSG ON MPD			← K8
K4 →	NAV DATA ON HSD					ALI/AUT ON HUD			← K9
K5 →	ATTACK CHK MSG ON MPD					RET TO CHK			← K10

FIGURE C-24 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE AIR DROP
PAGE NUMBER P44
PAGE NAME DROP SKE

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK	
K1 →	COMM CHG MSG ON MPD					SKE DATA ON HSD			← K6
K2 →	CARP DATA ON HSD					AUTO HDG MSG ON MPD			← K7
K3 →	RADAR DATA ON HSD					LOAD STAT MSG ON MPD			← K8
K4 →	NAV DATA ON HSD					ALT/ATT ON HUD			← K9
K5 →	ATTACK CHK MSG ON MPD					RET TO CHK			← K10

FIGURE C-25 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE AIR DROP
PAGE NUMBER P45
PAGE NAME LAPES

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK
K1 →	COMM CHG MSG ON MPD					CHK TRIM MSG ON MPD		← K6
K2 →	CARP DATA ON HSD					HI LIFT STATUS DISPLAY		← K7
K3 →	RADAR DATA ON HSD					LOAD STAT MSG ON MPD		← K8
K4 →	RADAR ALT ON HUD					ALT/ATT ON HUD		← K9
K5 →	SPARE					RET TO CHK		← K10

FIGURE C-26 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE DESC
PAGE NUMBER P51
PAGE NAME CHK

INTEGRATED MULTI-FUNCTION KEYBOARD

COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK
K1 →	CHK MASTER WARN				PLANNED DESC.		← K6
K2 →	MSG ON MPD				RAPID DESC		← K7
K3 →	CHK WING CONFIG DISPLAY				NORMAL DESC		← K8
K4 →	CHK ENG				PREC DESC		← K9
K5 →	SET W/P MSG ON MPD PRESS MSG ON MPD				STOL DESC		← K10

FIGURE C-27 - IMFK MESSAGES

MASTER MODE KEYBOARD

MASTER MODE DESC
 PAGE NUMBER P52
 PAGE NAME PLANNED DESCEND

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK
K1 →	COMM CHG MSG ON MPD					IFF/BEAC MSG ON MPD		← K6
K2 →	DESC. ALT HUD					RADAR HSD DISPLAY		← K7
K3 →	NAV HSD DISPLAY					ENGINE MSG ON MPD		← K8
K4 →	DESC. TIMING MSG ON MPD					ALT/ATT HUD		← K9
K5 →	ATTACK WARNING MSG ON MPD					RETURN TO CHK		← K10

FIGURE C-28 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE DESC
 PAGE NUMBER P53
 PAGE NAME RAPID DESCEND

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK
K1 →	COMM CHG MSG ON MPD	---	---	---	---	IFF/BEAC MSG ON MPD	---	← K6
K2 →	CMD ALT HUD	---	---	---	---	RADAR HSD DISPLAY	---	← K7
K3 →	NAV HSD DISPLAY	---	---	---	---	ENGINE MSG ON MPD	---	← K8
K4 →	DESC. TIMING MSG ON MPD	---	---	---	---	ALT/ATT HUD	---	← K9
K5 →	ATTACK WARNING MSG ON MPD	---	---	---	---	RETURN TO CHK	---	← K10

FIGURE C-29 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL
		AIR DROP	
TEST		DESC	APPR LAND
			POST FLIGHT

MASTER MODE DESC
PAGE NUMBER P54
PAGE NAME NORMAL DESCEND

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK
K1 →	COMM CHG MSG ON MPD					IFF/BEAC MSG ON MPD		← K6
K2 →	DESC. ALT HUD					RADAR HSD DISPLAY		← K7
K3 →	VOR/ILS HSD DISPLAY					ENGINE MSG ON MPD		← K8
K4 →	LANDING TIMING MSG ON MPD					ALT/ATT HUD		← K9
K5 →	ATTACK WARNING MSG ON MPD					RETURN TO CHK		← K10

FIGURE C-30 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE DESC
PAGE NUMBER P55
PAGE NAME PRECISION DESCEND

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK
K1 →	COMM CHG MSG ON MPD					IFF/BEAC MSG ON MPD		← K6
K2 →	PREC. ALT HUD					RADAR HSD DISPLAY		← K7
K3 →	VOR/ILS HSD DISPLAY					ENGINE MSG ON MPD		← K8
K4 →	LANDING TIMING MSG ON MPD					ALT/ATT HUD		← K9
K5 →	ATTACK WARNING MSG ON MPD					RETURN TO CHK		← K10

FIGURE C-31 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE DESC
PAGE NUMBER P56
PAGE NAME STOL DESCEND

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK	
K1 →	COMM CHG MSG_ON_MPD					IFF/BEAC MSG_ON_MPD			← K6
K2 →	STOL ALT HUD					RADAR HSD DISPLAY			← K7
K3 →	NAV HSD DISPLAY					ENGINE MSG_ON_MPD			← K8
K4 →	LANDING TIMING MSG ON MPD					ALT/ATT HUD			← K9
K5 →	ATTACK WARNING MSG ON MPD					RETURN TO CHK			← K10

FIGURE C-32 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE DESC
PAGE NUMBER P57
PAGE NAME RADAR DESCEND

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK
K1 →	COMM CHG MSG ON MPD					IFF/BEAC MSG ON MPD		← K6
K2 →	ALT HUD					RADAR HSD DISPLAY		← K7
K3 →	SPARE					ENGINE MSG ON MPD		← K8
K4 →	SPARE					ALT/ATT HUD		← K9
K5 →	ATTACK WARNING MSG ON MPD					RETURN TO CHK		← K10

FIGURE C-33 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE APPR
 PAGE NUMBER P61
 PAGE NAME ALL APPROACHES

INTEGRATED MULTI-FUNCTION KEYBOARD

COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK
K1 →	NORMAL				SET W/P MSG ON MPD		← K6
K2 →	PRECISION				SPARE		← K7
K3 →	STOL				SPARE		← K8
K4 →	RADAR				SPARE		← K9
K5 →	ABORT				SPARE		← K10

FIGURE C-34 - IMFK MESSAGES

MASTER MODE KEYBOARD

MASTER MODE APPR
PAGE NUMBER P62
PAGE NAME NORMAL

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK
K1 →	COMM CHG MSG ON MPD					GEAR STAT MSG ON MPD		← K6
K2 →	ALT CMD ON HUD					RADAR DATA ON HSD		← K7
K3 →	NAV DATA ON HSD					FLAP STAT MSG ON MPD		← K8
K4 →	LAND TIME MSG ON MPD					ATT DISPL ON HUD		← K9
K5 →	ABORT					RETURN TO ALL		← K10

FIGURE C-35 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE REFUEL	
		AIR DROP	
TEST		DESC	APPR LAND
			POST FLIGHT

MASTER MODE APPR
PAGE NUMBER P63
PAGE NAME PRECISION

INTEGRATED MULTI-FUNCTION KEYBOARD

COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK
K1 →	COMM CHG MSG ON MPD				GEAR STAT MSG ON MPD		← K6
K2 →	PREC. ALT ON HUD				RADAR DATA ON HSD		← K7
K3 →	VOR/ILS ON HSD				FLAP STAT MSG ON MPD		← K8
K4 →	LAND TIME MSG ON MPD				ATT DISPL ON HUD		← K9
K5 →	ABORT				RETURN TO ALL		← K10

FIGURE C-36 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE APPR
 PAGE NUMBER P64
 PAGE NAME STOL

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK
K1 →	COMM CHG MSG ON MPD					GEAR STAT MSG ON MPD		← K6
K2 →	STOL ALT ON HUD					RADAR DATA ON HSD		← K7
K3 →	NAV DAT ON HSD					FLAP STAT MSG ON MPD		← K8
K4 →	LAND TIME MSG ON MPD					ATT DISPL ON HUD		← K9
K5 →	ABORT					RETURN TO ALL		← K10

FIGURE C-37 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL
		AIR DROP	
TEST		DESC	APPR LAND
			POST FLIGHT

MASTER MODE APPR

PAGE NUMBER P65

PAGE NAME RADAR

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK
K1 →	COMM CHG MSG ON MPD	---	---	---	---	GEAR STAT MSG ON MPD	---	← K6
K2 →	ALT ON HUD	---	---	---	---	RADAR DATA ON HSD	---	← K7
K3 →	RADAR DATA ON HSD	---	---	---	---	FLAP STAT MSG ON MPD	---	← K8
K4 →	LAND TIME MSG ON MPD	---	---	---	---	ATT DISPL ON HUD	---	← K9
K5 →	ABORT	---	---	---	---	RETURN TO ALL	---	← K10

FIGURE C-38 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL
		AIR DROP	
TEST		DESC	APPR LAND
			POST FLIGHT

MASTER MODE APPR
PAGE NUMBER P66
PAGE NAME ABORT

INTEGRATED MULTI-FUNCTION KEYBOARD

COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK
K1 →	COMM CHG MSG ON MPD	---	---	---	GEAR STAT MSG ON MPD	---	← K6
K2 →	ALT CMD HUD	---	---	---	RADAR DATA ON HSD	---	← K7
K3 →	SAME DATA ON HSD	---	---	---	FLAP STAT MSG ON MPD	---	← K8
K4 →	LAND TIME MSG ON MPD	---	---	---	ATT DISPL ON HUD	---	← K9
K5 →	SPARE	---	---	---	RETURN TO ALL	---	← K10

FIGURE C-39 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE APPR/LAND

PAGE NUMBER P71

PAGE NAME TAXI

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK
K1 →	CHK ANTI-SKID					CHK WING CONFIG		← K6
K2 →	CHK AIR VENTS					CHK TH REV		← K7
K3 →	CHK LIGHTS					CHK TRIM		← K8
K4 →	CHK PITOT					CHK BEACON		← K9
K5 →	CHK DE ICE					DISPL SID ON HSD		← K10

FIGURE S-40 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE POST FLT

PAGE NUMBER P72

PAGE NAME PARK

INTEGRATED MULTI-FUNCTION KEYBOARD

COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK
K1 →	CHK ALL DOORS				SHUT DOWN AVIONICS		← K6
K2 →	CHK ENGINES OFF				SHUT DOWN COMP DISPL		← K7
K3 →	CHK PRESS				USE MANUAL CHK LIST		← K8
K4 →	SPARE				TURN OFF BATTERIES		← K9
K5 →	SPARE				PREFLIGHT CHK REQUIRED		← K10

FIGURE C-41 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE TEST
PAGE NUMBER P81
PAGE NAME TURN-ON

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK
K1 →	COMPUTERS ACTIVATED					CHK HUD STDBY RET		← K6
K2 →	AVIONICS ACTIVATED					CHK HUD CRUISE IMG		← K7
K3 →	INS ALIGN MSG ON MPD					CHK HUD SPEC IMG		← K8
K4 →	LAT LONG MSG ON MPD					CHK HUD APPR IMG		← K9
K5 →	MAG VAR MSG ON MPD					SKP PGS 2 - 5		← K10

FIGURE C-42 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE TEST
PAGE NUMBER P82
PAGE NAME COMM-SET

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK	
K1	→	CHG HF/SSB MSG ON MPD	--	--	--	CHK SEC VOICE	--	--	← K6
K2	→	CHG VHF/AM MSG ON MPD	--	--	--	CHK PA SYS	--	--	← K7
K3	→	CHG VHF/FM MSG ON MPD	--	--	--	CHK INTERPHONE	--	--	← K8
K4	→	CHG UHF/#1 MSG ON MPD	--	--	--	SET TACAN MSG ON MPD	--	--	← K9
K5	→	CHG UHF/#2 MSG ON MPD	--	--	--	SET RADAR MSG ON MPD	--	--	← K10

FIGURE C-43 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE TEST
 PAGE NUMBER P83
 PAGE NAME NAV-SET

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK
K1 →	CHK TACAN MSG ON MPD					CHK AHRS MSG ON MPD		← K6
K2 →	CHK ILS #1 MSG ON MPD					CHK OMEGA MSG ON MPD		← K7
K3 →	CHK ILS #2 MSG ON MPD					SELECT SID		← K8
K4 →	CHK ADF HF MSG ON MPD					FUTURE NAV		← K9
K5 →	CHK ADF MSG ON MPD					FUTURE NAV		← K10

FIGURE C-44 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE TEST
PAGE NUMBER P84
PAGE NAME POS-SET

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK
K1 →	CHK RADAR MSG ON MPD					CHG BARO ALT MSG ON MPD		← K6
K2 →	CHK R ALTS MSG ON MPD					CHK AIR DATA MSG ON MPD		← K7
K3 →	CHK R BCN MSG ON MPD					CHK DFCS MSG ON MPD		← K8
K4 →	CHK SKE MSG ON MPD					FUTURE POS		← K9
K5 →	CHK IFF MSG ON MPD					FUTURE POS		← K10

FIGURE C-45 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE TEST

PAGE NUMBER P85

PAGE NAME DISPL. CHK

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK
K1 →	CHK HSD NORTH UP					CHK STDBY INS		← K6
K2 →	CHK HSD TRACK UP					ENGINE START MSG ON MPD		← K7
K3 →	CHK MPD 1 MSG ON MPD					CHK SURF. DISPL		← K8
K4 →	CHK MPD 2 MSG ON MPD					SPARE		← K9
K5 →	CHK MPD 3 MSG ON MPD					SPARE		← K10

FIGURE C-46 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE REFUEL	
		AIR DROP	
TEST		DESC	APPR LAND
			POST FLIGHT

MASTER MODE SPECIFIC
 PAGE NUMBER P-B1
 PAGE NAME BRUTEFORCE NAV 1

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK
K1 →	VOR/ILS (2) GO TO PB2					INS GO TO PB2		← K6
K2 →	TACAN GO TO PB2					OMEGA GO TO PB2		← K7
K3 →	ADF/BCN (2) GO TO PB2					DOPPLER GO TO PB2		← K8
K4 →	SIF GO TO PB2					AREA NAV GO TO PB2		← K9
K5 →	BEACON GO TO PB2					PAR GO TO PB2		← K10

FIGURE C-47 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE SPECIFIC
PAGE NUMBER P-B2
PAGE NAME BRUTEFORCE NAV 2

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK
K1 →	POWER IMFK + DEK					MDA/DH IMFK + DEK		← K6
K2 →	COURSE SET IMFK + DEK					AIR TO AIR IMFK + DEK		← K7
K3 →	STA. IDENT IMFK + DEK					A-A RECV IMFK + DEK		← K8
K4 →	FREQ. /CHAN. IMFK + DEK					STA. ELEV. IMFK + DEK		← K9
K5 →	BACK CRS IMFK + DEK					RET TO NAV.		← K10

FIGURE C-48 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE SPECIFIC

PAGE NUMBER P-B3

PAGE NAME BRUTEFORCE COMM 1

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK
K1 →	UHF #1 GO TO PB 4					INTERPHONE GO TO PB4		← K6
K2 →	UHF #2 GO TO PB4					P.A. SYS GO TO PB4		← K7
K3 →	VHF/AM TO TO PB4					SEC VOICE GO TO PB4		← K8
K4 →	VHF/FM GO TO PB4					SPARE		← K9
K5 →	HF/SSB GO TO PB4					SPARE		← K10

FIGURE C-49 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL
		AIR DROP	
TEST		DESC	APPR LAND
			POST FLIGHT

MASTER MODE SPECIFIC
PAGE NUMBER P-B4
PAGE NAME BRUTE FORCE COMM 2

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK
K1	→	POWER IMFK + DEK	- -	- -	- -	FREQ/CHAN IMFK + DEK	- -	← K6
K2	→	GUARD/XMIT IMFK + DEK	- -	- -	- -	SPARE	- -	← K7
K3	→	SQUELCH IMFK + DEK	- -	- -	- -	SPARE	- -	← K8
K4	→	XMIT/RECV IMFK + DEK	- -	- -	- -	SPARE	- -	← K9
K5	→	ADF IMFK + DEK	- -	- -	- -	RETURN TO COM	- -	← K10

FIGURE C -50 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE SPECIFIC
 PAGE NUMBER P-B5
 PAGE NAME BRUTEFORCE C/D 1

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK
K1 →	HUD-P* GO TO PB6					HUD-CP* GO TO PB6		← K6
K2 →	HSD-P GO TO PB6					HSD-CP GO TO PB6		← K7
K3 →	MPD-1 GO TO PB6					MPD - 3 GO TO PB6		← K8
K4 →	MPD-2 GO TO PB6					SPARE		← K9
K5 →	FORMAT MOD GO TO PB6					SPARE		← K10

FIGURE C-51 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE REFUEL	
		AIR DROP	
TEST		DESC	APPR LAND
			POST FLIGHT

MASTER MODE SPECIFIC
 PAGE NUMBER P-B6
 PAGE NAME BRUTEFORCE C/D 2

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK
K1 →	EAS/MACH IMFK + HUD					FLT. PATH IMFK + HUD		← K6
K2 →	GND SPD IMFK + HUD					PITCH LADR IMFK + HUD		← K7
K3 →	TAS IMFK + HUD					ANG ATTACK IMFK + HUD		← K8
K4 →	ENERG MGMT IMFK + DISPL.					VERT. VEL. IMFK + HUD		← K9
K5 →	FLT DIR. IMFK + HUD					RET TO C/D		← K10

FIGURE C-52 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE SPECIFIC
PAGE NUMBER P-B7
PAGE NAME BRUTEFORCE CARGO

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK
K1 →	CHK M WARN MSG ON MPD					DROP TIME MSG ON MPD		← K6
K2 →	CHK HI LIFT MSG ON MPD					DOORS STAT MSG ON MPD		← K7
K3 →	CHK ALTVEL ON HUD					SPARE		← K8
K4 →	CHK PRESS MSG ON MPD					SPARE		← K9
K5 →	CHK ESM MSG ON MPD					SET CARP		← K10

FIGURE C-53 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE SPECIFIC
PAGE NUMBER P-B8
PAGE NAME BRUTEFORCE SYST 1

INTEGRATED MULTI-FUNCTION KEYBOARD

COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK
K1 →	CHK FUEL MSG ON MPD				CHK ELECTR MSG ON MPD		← K6
K2 →	CHK LOX MSG ON MPD				CHK RAT MSG ON MPD		← K7
K3 →	CHK HYDR. MSG ON MPD				CHK A/R DOOR		← K8
K4 →	CHK WING CONFIG.				CHK PRESS MSG ON MPD		← K9
K5 →	CHK TRIM MSG ON MPD				CHK ANTI/SKID		← K10

FIGURE C-54 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE SPECIFIC

PAGE NUMBER P-B9

PAGE NAME BRUTEFORCE SYST 2

INTEGRATED MULTI-FUNCTION KEYBOARD

COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK
K1 →	CHK DE ICE MSG ON MPD				CHK ALL DR MSG ON MPD		← K6
K2 →	CHK PITOT MSG ON MPD				CHK PNEU		← K7
K3 →	CHK DEFOG MSG ON MPD				ENG FAIL MSG ON MPD		← K8
K4 →	CHK E/R MSG ON MPD				CHK. SW. SET MSG ON MPD		← K9
K5 →	CHK TH REV MSG ON MPD				RETURN TO P K		← K10

FIGURE C-55 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	RE CONFIG
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE SPECIFIC
PAGE NUMBER P-BID
PAGE NAME BRUTEFORC UBR

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK
K1 →	TBD	TBD	TBD	TBD	TBD	TBD	TBD	← K6
K2 →	TBD	TBD	TBD	TBD	TBD	TBD	TBD	← K7
K3 →	TBD	TBD	TBD	TBD	TBD	TBD	TBD	← K8
K4 →	TBD	TBD	TBD	TBD	TBD	TBD	TBD	← K9
K5 →	TBD	TBD	TBD	TBD	TBD	TBD	TBD	← K10

FIGURE C-56 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE SPECIFIC
PAGE NUMBER P-B11
PAGE NAME BRUTEFORCE CHKLIST

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK	
K1 →	RUNWAY CHKLIST					DESCEND CHKLIST			← K6
K2 →	CLIMB CHKLIST					APPROACH CHKLIST			← K7
K3 →	CRUISE CHKLIST					PREFLT CHKLIST			← K8
K4 →	REFUEL CHKLIST					POST FLT CHKLIST			← K9
K5 →	AIR DROP CHKLIST					SPARE			← K10

FIGURE C-57 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL
		AIR DROP	
TEST		DESC	APPR LAND
			POST FLIGHT

MASTER MODE SPECIFIC
PAGE NUMBER P-B12
PAGE NAME RUNWAY CHKLST

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK
K1 →	COMM CHG MSG ON MPD					READ IAS MSG ON MPD		← K6
K2 →	TCN CHG MSG ON MPD					READ TAS MSG ON MPD		← K7
K3 →	CMD HDG MSG ON MPD					READ GND SPD MSG ON MPD		← K8
K4 →	ALT SET MSG ON MPD					READ GND SPD MSG ON MPD		← K9
K5 →	IFF CHG MSG ON MPD					MONITOR THRUS T		← K10

FIGURE C-58 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE REFUEL	
		AIR DROP	
TEST		DESC	APPR LAND
			POST FLIGHT

MASTER MODE SPECIFIC
PAGE NUMBER P-B13
PAGE NAME CLIMB CHKLIST

INTEGRATED MULTI-FUNCTION KEYBOARD

COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK
K1 →	ANTI SKID ON MSG ON MPD	--	--	--	ADD W/P MSG ON MPD	--	← K6
K2 →	GEAR UP MSG ON MPD	--	--	--	DELETE W/P MSG ON MPD	--	← K7
K3 →	FLAPS UP MSG ON MPD	--	--	--	CLIMB ALONE	--	← K8
K4 →	CHK M WARN MSG ON MPD	--	--	--	CLIMB SKE	--	← K9
K5 →	SELECT W/P ENTER NO. & K5	--	--	--	SPARE	--	← K10

FIGURE C-59 - IMFK MESSAGES

MASTER MODE KEYBOARD

MASTER MODE SPECIFIC
 PAGE NUMBER P-B14
 PAGE NAME CRUISE CHKLIST

PRE FLIGHT	T/O CLIMB	CRUISE REFUEL	
		AIR DROP	
TEST		DESC	APPR LAND
			POST FLIGHT

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SFMS	C/D	SYST	LIBR	CHK
K1 →	CHK M WARN MSG ON MPD					ADD W/P MSG ON MPD		← K6
K2 →	CHK DEFOG MSG ON MPD					DELETE W/P MSG ON MPD		← K7
K3 →	CHK DE ICE MSG ON MPD					CRUISE ALO		← K8
K4 →	CHK PITOT MSG ON MPD					CRUISE SKE		← K9
K5 →	SELECT W/P MSG ON MPD					CRUISE GPS		← K10

FIGURE C-60 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE SPECIFIC
PAGE NUMBER P-B15
PAGE NAME REFUEL CHKLIST

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK
K1 →	COMM CHG MSG ON MPD					CHK M WARN MSG ON MPD		← K6
K2 →	CHK BEACON MSG ON MPD					DFCS STAT MSG ON MPD		← K7
K3 →	CHK A/R DR MSG ON MPD					CHK VALVES MSG ON MPD		← K8
K4 →	CHK TRIM MSG ON MPD					SPARE		← K9
K5 →	CHK SPEED MSG ON MPD					LOAD		← K10

FIGURE C-61 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL
		AIR DROP	
TEST		DESC	APPR LAND
			POST FLIGHT

MASTER MODE SPECIFIC

PAGE NUMBER P-B16

PAGE NAME AIR DROP CHKLIST

INTEGRATED MULTI-FUNCTION KEYBOARD

COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK
K1 →	CHK M WARN MSG ON MPD	--	--	--	DROP TIME MSG ON MPD	--	← K6
K2 →	CHK HI LIFT MSG ON MPD	--	--	--	DOORS STAT MSG ON MPD	--	← K7
K3 →	CHK ALT VEL ON HUD	--	--	--	IFF/BEAC MSG ON MPD	--	← K8
K4 →	CHK PRESS MSG ON MPD	--	--	--	SPARE	--	← K9
K5 →	CHK ESM MSG ON MPD	--	--	--	SET CARP	--	← K10

FIGURE C-62 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE SPECIFIC
PAGE NUMBER P-B17
PAGE NAME DESCEND CHKLIST

INTEGRATED MULTI-FUNCTION KEYBOARD

COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK
K1 →	CHK MASTER WARN MSG ON MPD				PLANNED DESC.		← K6
K2 →	CHK WING CONFIG DISPLAY				RAPID DESC		← K7
K3 →	CHK ENG				NORMAL DESC		← K8
K4 →	SET W/P MSG ON MPD				PREC DESC		← K9
K5 →	PRESSURIZATION MSG ON MPD				STOL DESC		← K10

FIGURE C-63 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE REFUEL	
	AIR DROP		
TEST	DESC	APPR LAND	POST FLIGHT

MASTER MODE SPECIFIC
PAGE NUMBER P-B18
PAGE NAME APPROACH CHKLIST

INTEGRATED MULTI-FUNCTION KEYBOARD

	COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK
K1 →	NORMAL					SET W/P MSG ON MPD		← K6
K2 →	PRECISION					SPARE		← K7
K3 →	STOL					SPARE		← K8
K4 →	RADAR					SPARE		← K9
K5 →	ABORT					SPARE		← K10

FIGURE C-64 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE REFUEL	
		AIR DROP	
TEST		DESC	APPR LAND
			POST FLIGHT

MASTER MODE SPECIFIC
PAGE NUMBER P-B19
PAGE NAME PREFLIGHT CHKLIST

INTEGRATED MULTI-FUNCTION KEYBOARD

COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK
K1 →	COMPUTERS ACTIVATED				CHK HUD STDBY RET		← K6
K2 →	AVIONICS ACTIVATED				CHK HUD CRUISE IMG		← K7
K3 →	INS ALIGN MSG ON MPD				CHK HUD SPEC IMG		← K8
K4 →	LAT LONG MSG ON MPD				CHK HUD APPR IMG		← K9
K5 →	MAG VAR MSG ON MPD				SKP PGS 2 - 5		← K10

FIGURE C-65 - IMFK MESSAGES

MASTER MODE KEYBOARD

PRE FLIGHT	T/O CLIMB	CRUISE	REFUEL	
		AIR DROP		
TEST		DESC	APPR LAND	POST FLIGHT

MASTER MODE SPECIFIC
PAGE NUMBER P-B20
PAGE NAME POST FLIGHT CHKLIST

INTEGRATED MULTI-FUNCTION KEYBOARD

COMM	NAV	CARGO	SENS	C/D	SYST	LIBR	CHK
K1 →	CHK ANTI-SKID				CHK WING CONFIG		← K6
K2 →	CHK AIR VENTS				CHK TH REV		← K7
K3 →	CHK LIGHTS				CHK TRIM		← K8
K4 →	CHK PITOT				CHK BEACON		← K9
K5 →	CHK DE ICE				DISPL SID ON HSD		← K10

FIGURE C-66 - IMFK MESSAGES

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APPENDIX D

TO

FINAL TECHNICAL REPORT

FOR

AFAL CONTRACT NUMBER F33615-76-C-1297

IDAMST AVIONICS/FLIGHT CONTROL

SOFTWARE INTERFACE SPECIFICATION

FLIGHT CONTROL SOFTWARE INTERFACE

The contractor is required by this task to propose a recommended Avionics-Flight Control Software Interface specification using the guidelines of Appendix "K" of the contract as a baseline. The resulting document is incorporated as Appendix D in Volume II of this report.

The Douglas C-15 AMST characteristics were used as the basis for determining interface requirements. At the time the document was proposed, no production configuration of the Flight Control Subsystem had been defined, and indeed, none will not by the time the IDAMST Phase I contract is completed. Therefore, the specification must be regarded as preliminary. The interface is a conservative approach to maintaining flight safety independently of IDAMST with consideration of the special flight modes associated with the AMST.

IDAMST

IDAMST/FLIGHT CONTROL SYSTEM (FCS)

SIGNAL INTERFACE

PRELIMINARY

MAY 14, 1976

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 - 3.2.2 PARAMETER DATA RATES

1.0 SCOPE

This specification defines the signal interface between the C-15 Flight Control System (FCS) and the IDAMST Avionics equipments. The signal interface is an assignment of the required input sensor data and output command data to the FCS utilizing the IDAMST Data bus or aircraft wiring as the transmission medium. Included in the interface is the presentation of signal sources and their routing between the FCS and the IDAMST Avionics since an individual parameter may, or may not, be assigned to both systems using the same transmission medium.

2.0 APPLICABLE DOCUMENTS.

The following documents form a part of this specification to the extent specified herein.

- IDAMST Avionics RT Assignment Drawing
- ARINC - 561, Air Transport Inertial Navigation System - (INS)
- ARINC - 569, Heading and Attitude Sensor - (HAS)
- ARINC - 575, Mark 3 Sub-Sonic Air Data Systems (DIGITAL)-(DADS)
- AN/ARN - 108, Instrument Landing System
- AN/APN - 194(v), Radar Altimeter System
- ARINC - 407-1, Arinc Synchro Signal Practices

3.0 REQUIREMENTS

3.1 Interface Definition.

The IDAMST Avionics System uses sensor data to compute the command outputs and display information for different application functions. The inter-and intra-data communications between the IDAMST core elements and the application equipment is accomplished by means of a redundant digital data multiplexed bus system.

The C-15 FCS is a dual redundant, fail safe, digital computer configuration utilizing redundant computations with in-line and cross-channel monitoring. The IDAMST sensor equipment list applicable to FCS utilization is listed in Table 1. The common information

TABLE 1.
FCS RELATED IDAMST SENSORS
 (Does not include FCS Unique Sensors)

<u>Equipment Item</u>	<u>Applicable Specification</u>	<u>Equipment Utilization</u>
Carousel IV INS	ARINC-561	<ul style="list-style-type: none"> ● Source of Aircraft Primary Inertial Data. ● Computation of Inertial Navigation Display Parameters and Steering Commands.
HAS	ARINC-569	<ul style="list-style-type: none"> ● Alternate Source of Aircraft Inertial Data.
ILS Receiver	AN/ARN-108	<ul style="list-style-type: none"> ● Source of Localizer and Glideslope Deviation.
TACAN Receiver		<ul style="list-style-type: none"> ● Source of TACAN Station Course, Course Deviation, and Station Distance.
VOR		<ul style="list-style-type: none"> ● Source of VOR Station Course and Course Deviation.
Radio Altimeter	AN/APN-194(v)	<ul style="list-style-type: none"> ● Source of Height above Ground Level.
Air Data Computer	ARINC-575	<ul style="list-style-type: none"> ● Source of Computed Atmospheric Data for Aircraft Flight Instruments and FCS.
Ground Sense Relays	-	<ul style="list-style-type: none"> ● Provides Discrete Information Regarding Aircraft Weight on Nose Landing Gear for Equipment Interlock Functions.
Flap Position Switches	-	<ul style="list-style-type: none"> ● Provides Discrete Information of Flap Position relative to Fixed Positions for Equipment Interlock Functions.

shared between the IDAMST Avionics system and the separately configured FCS is the subject of this "Interface" specification.

3.1.1 Interface Diagrams.

Figures 1 through 9 illustrate the required FCS/IDAMST equipment signal interface configuration. The interface configuration is chosen to maintain the FCS redundancy concept for the flight critical modes of stability and control augmentation (SCAS) and automatic coupled ILS approaches. The basic premise is to maintain the FCS fail-safe capability. To this end the IDAMST Bus configuration is considered functionally to be two separately engageable single channels as opposed to a dual channel configuration. Thus the IDAMST Bus monitoring and reconfiguration scheme is not relied upon to provide the requisite FCS signal duality.

3.1.2 Interface Discussion

3.1.2.1 Overview.

Figure 1 gives an overview of the FCS input and output equipment assignment to aircraft wiring and to IDAMST multiplex bus communication methods. The sensor inputs and FCS command outputs are divided into 4 Signal Groups. Group 1 are FCS outputs that are to be displayed to the flight crew. These parameters must be transmitted via the multiplexed data bus since this is the only access to the cockpit electronic displays.

Group 2 includes FCS parameters that are available on the data bus as a result of independent IDAMST requirements and which are required also for FCS functions. However, the FCS associated functions are not the flight critical SCAS or landing approach functions.

Group 3 contains those parameters considered FCS Flight critical. Also included are FCS unique signals which have no function in other IDAMST applications. The sources of FCS flight critical data which are also shared by other IDAMST functions are shown routed to appropriate Remote Terminals (RT's).

FCS IDAMST INTERFACE - CONFIGURATION 1A

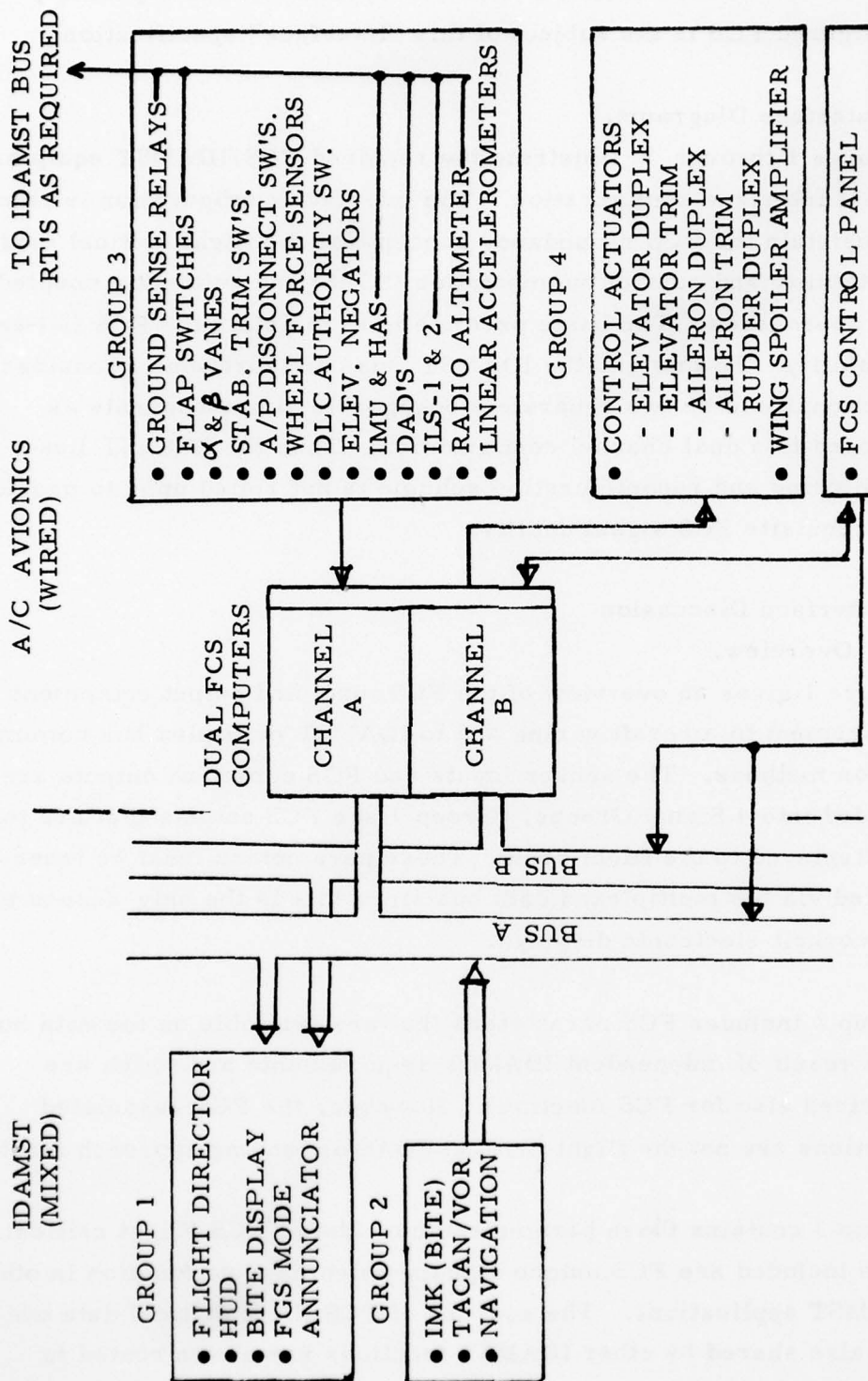


FIGURE 1.

Group 4 contain the Aircraft control surface commands computed by the FCS (except also included is the FCS aural warning system input). The control surface servo actuator electronics will be included within the FCS computers, or an electronics adapter box. Group 4 equipment parameters while functionally are FCS outputs do actually have signals flowing in both directions. All signal interfaces to the FCS from both the IDAMST bus and the direct aircraft wiring are analog or discrete d. c. voltages with the exception of aircraft attitude and heading signals which are a. c. synchro signals.

3.1.2.2 Group 3 Interfaces

The following subparagraphs discuss the Group 3 Interfaces. This group contains the hybrid FCS/IDAMST signal sources in which a single signal source routes a parameter to both the IDAMST Avionics Bus and the FCS hardwired input terminals.

3.1.2.2.1 IMU and HAS Interface

Figure 2 schematically indicates the signal division between the IDAMST Avionics System, the Flight Control System and the two equipment sources of aircraft attitude and heading information.

Both the CAROUSEL IV INS and the ARINC 569 Heading and Attitude Sensor system (HAS) provide two or more electrically isolated sources of pitch (θ) and roll (ϕ) attitude information and a single heading source. These signal sources are wired directly to the FCS and to the IDAMST RT Numbers 6 and 8 as shown in Figure 2. This signal division will not allow a fault in either the FCS or IDAMST systems to affect the Pitch and Roll information received by the other system.

The primary and auxillary attitude validity discretes from both the INS and HAS are wired to the IDAMST RT's and FCS respectively.

IMU & HAS INTERFACE

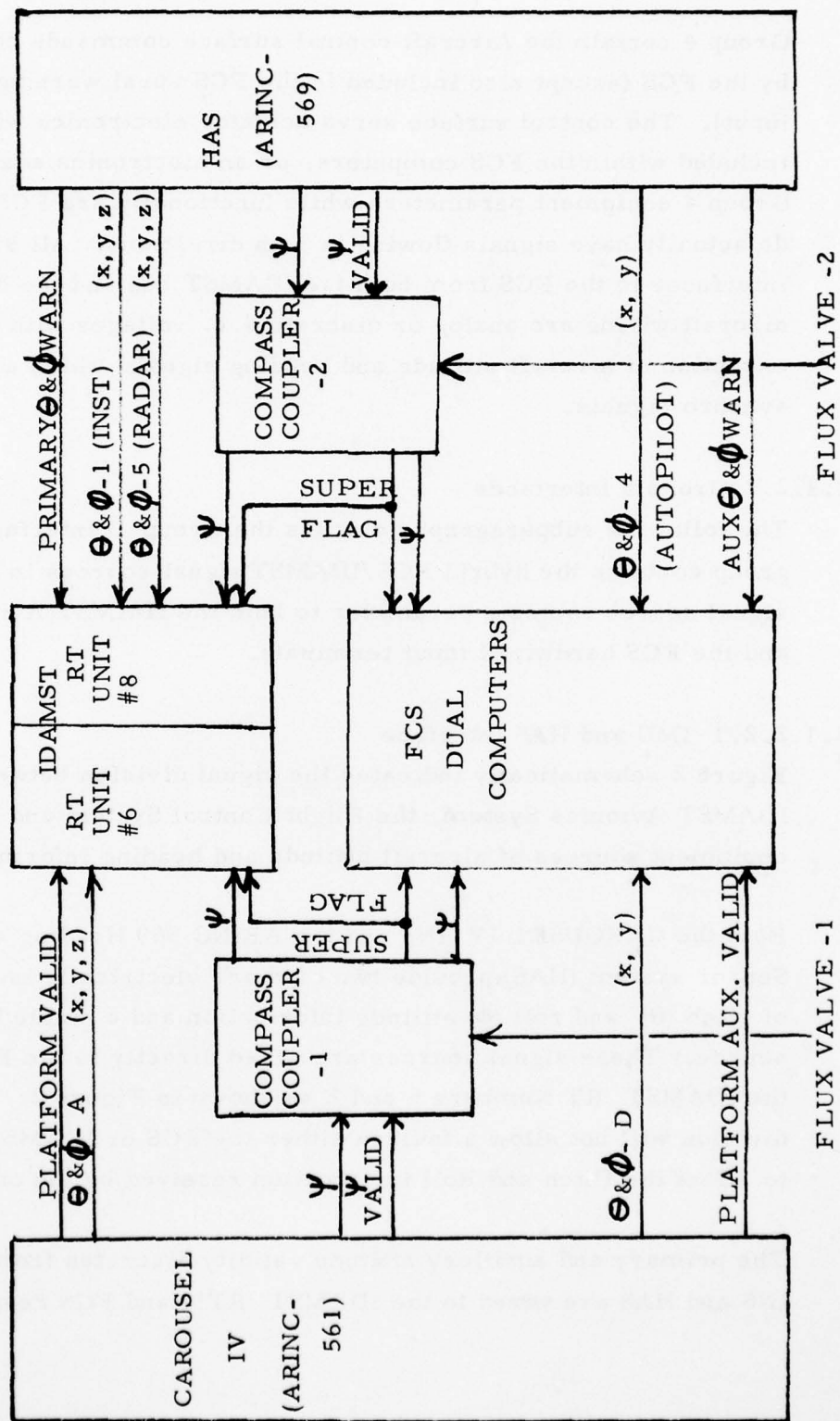


FIGURE 2.

The aircraft heading information from each of the attitude sources is routed to compass couplers where the gyro azimuth is updated with the earth's magnetic heading obtained from Flux valve inputs. The updated (slaved) heading information in each compass coupler is split into two electrically isolated sources. The two heading sources are routed, exclusively, to the IDAMST Remote Terminals and the FCS.

The heading validity signal from the INS and HAS sources is combined in the compass coupler with internal coupler validity signals to produce a super flag discrete voltage which is routed to both the IDAMST RT's and the FCS.

Notice that the FCS uses only the x-y leg voltages from the synchro sources. IDAMST is provided all x-y-z synchro voltages.

3.1.2.2.2 ILS Interface

Figure 3 shows the ILS receiver interface with the IDAMST Avionics and FCS. Only one receiver is shown but the second receiver is interfaced identically except for the Remote Terminal unit numbers.

The 14 NAV radio frequency select discrete signal wires from both the CAPT's and FO's NAV frequency select on the FGS panel are wired to IDAMST Remote Terminals 6 and 8 respectively.

From each ILS receiver the low-level glideslope and localizer deviation and flag voltages are wired directly to the FCS.

The high-level glideslope and localizer deviation and flag voltages from each receiver are wired to an IDAMST remote terminal; terminal No. 6 for the Captain's radios and terminal No. 8 for the First Officer's radio. These RT's are fitted with analog voltage interface modules for these signals. In addition to the deviation and flag voltages the marker beacon lamp discrettes are wired to a discrete interface module on the associated RT.

ILS INTERFACE

(SAME FOR BOTH -1 & -2 RECEIVERS)

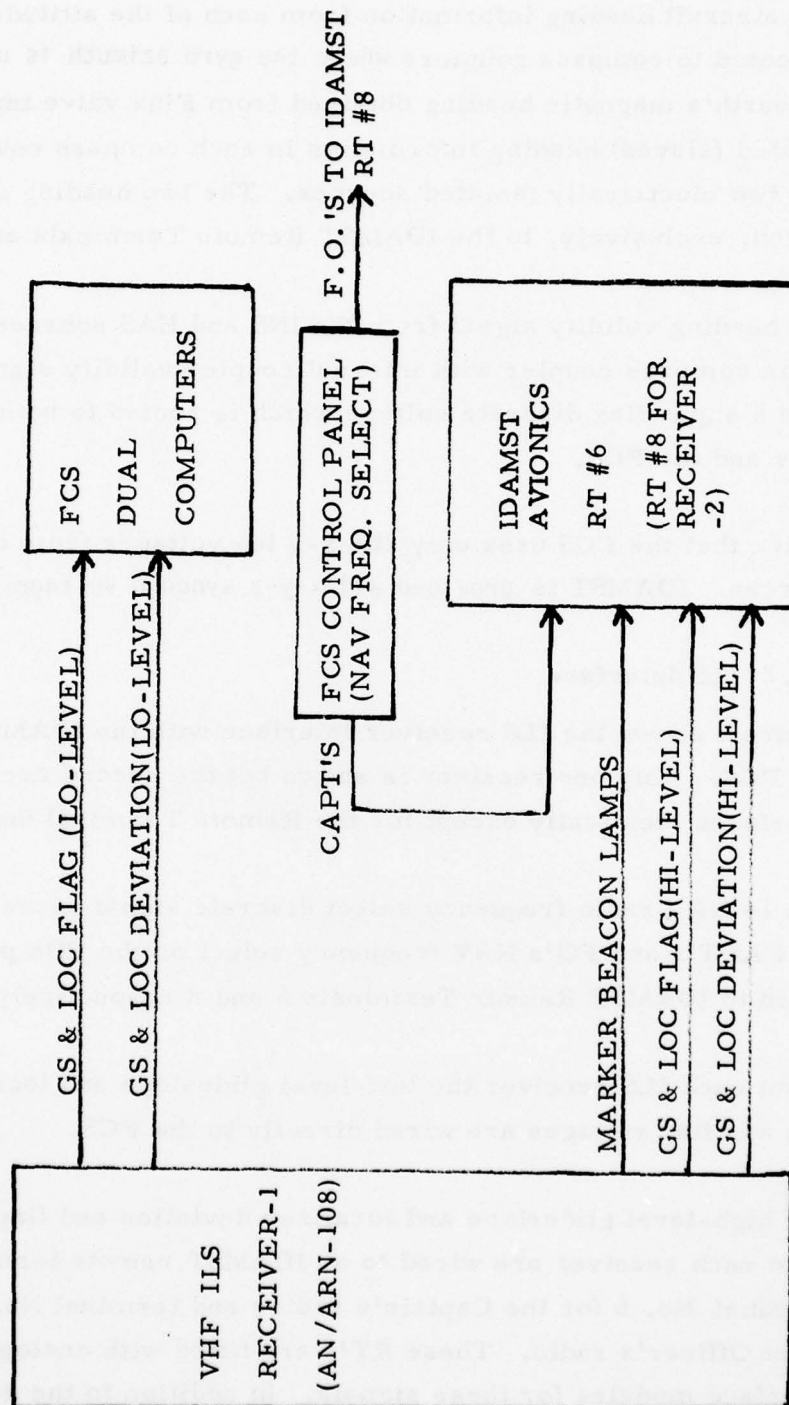


FIGURE 3.

3.1.2.2.3 Digital Air Data System

The Digital Air Data System (DADS) is interfaced to the FCS and IDAMST Avionics Bus as shown in Figure 4.

The FCS Air Data inputs and outputs are connected directly to the DADS. The FCS is wired to the DADS analog voltage outputs for Vertical Speed, Indicated Air Speed, Mach, and the signal reference dc voltage output. The FCS receives the DADS digitally encoded altitude from the DADS Number 3 digital data output bus.

The FCS receives the DADS air data validity voltages directly from the DADS. However, the same DADS discrete line drivers also input to a single ended discrete input interface module on the IDAMST Remote Terminal Number 7.

The FCS sends IAS, MACH, and ALTITUDE HOLD discrete voltages to the DADS whenever the DADS is to provide these parameters on the output lines.

The IDAMST receives air data parameters from the DADS digital data output buses Numbers 1 and 2.

3.1.2.2.4 Radio Altimeter Interface

Figure 5 shows the Radio Altimeter Interface with the FCS and IDAMST. The two dc analog voltage outputs of the altimeter R/T are routed one each to the FCS and to the IDAMST RT Number 7. The single Altimeter Valid discrete is "T'd" and routed to both the FCS and the IDAMST RT.

3.1.2.3 Group 2 Interfaces

The FCS Group 2 interfaces (Ref. Figure 1), are specified in this section. All the parameters in Group 2 arrive at the FCS as dc analog or discrete voltages from the IDAMST data bus.

DADS' INTERFACE

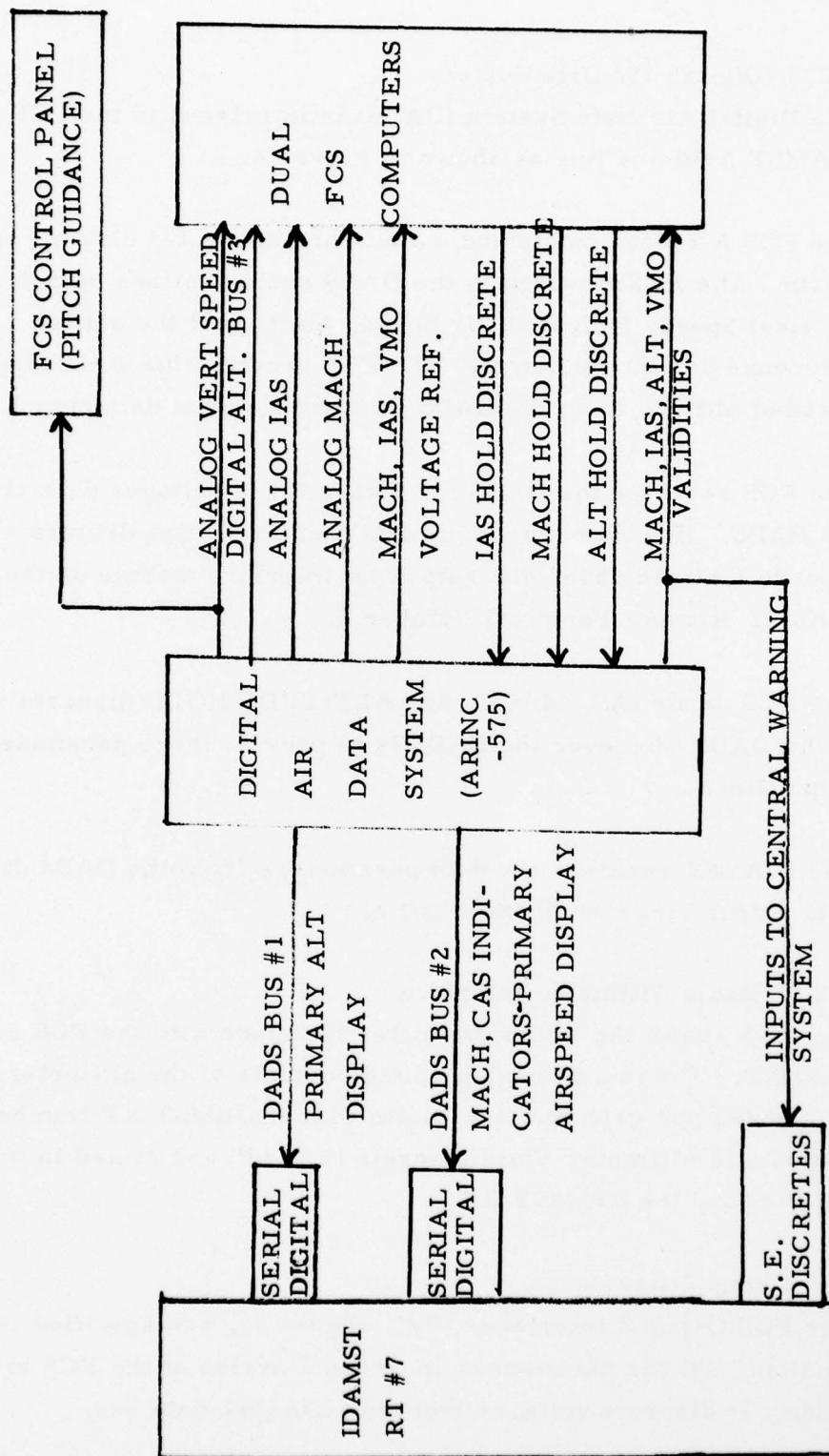
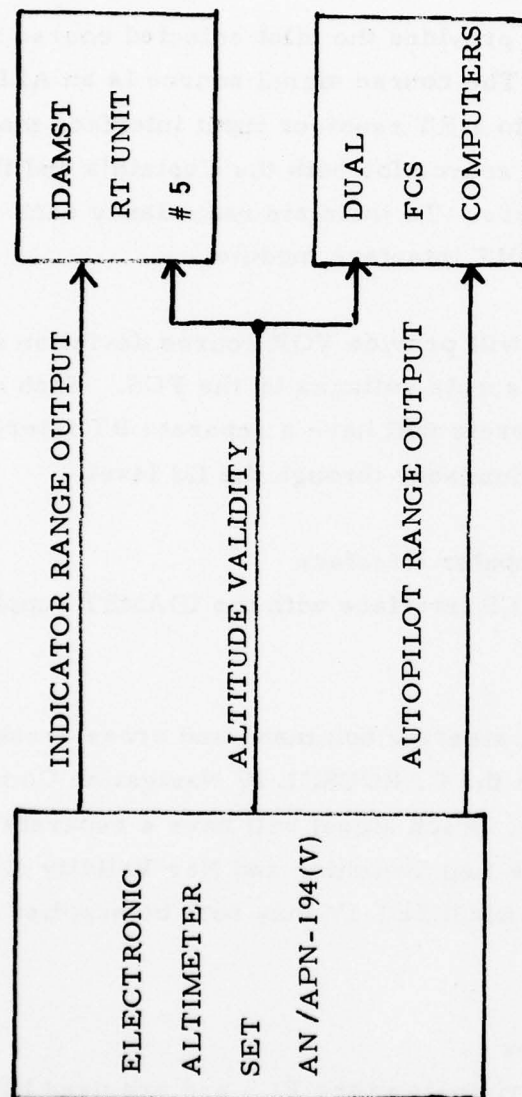


FIGURE 4.

RADIO ALTIMETER INTERFACE



Note: Second altimeter is interfaced identically except it is wired to Remote Terminal #7.

FIGURE 5.

3.1.2.3.1 VOR Interface

Figure 6 shows the FCS VOR interface. The FCS communicates with the VOR receivers indirectly via the IDAMST Digital Data Bus.

The FCS control panel provides the pilot selected course radial to the VOR receiver. The course signal source is an ARINC synchro-resolver and is wired to a RT resolver input interface module. There is a separate resolver source for both the Captain's and the First Officer's radio receivers. To maintain redundancy each resolver is wired to a separate RT interface module.

The IDAMST data bus will provide VOR course deviation dc analog and VOR validity dc discrete voltages to the FCS. Each deviation signal and validity discrete will have a separate RT interface module to maintain redundancy through the IM level.

3.1.2.3.2 Navigation Computer Interface

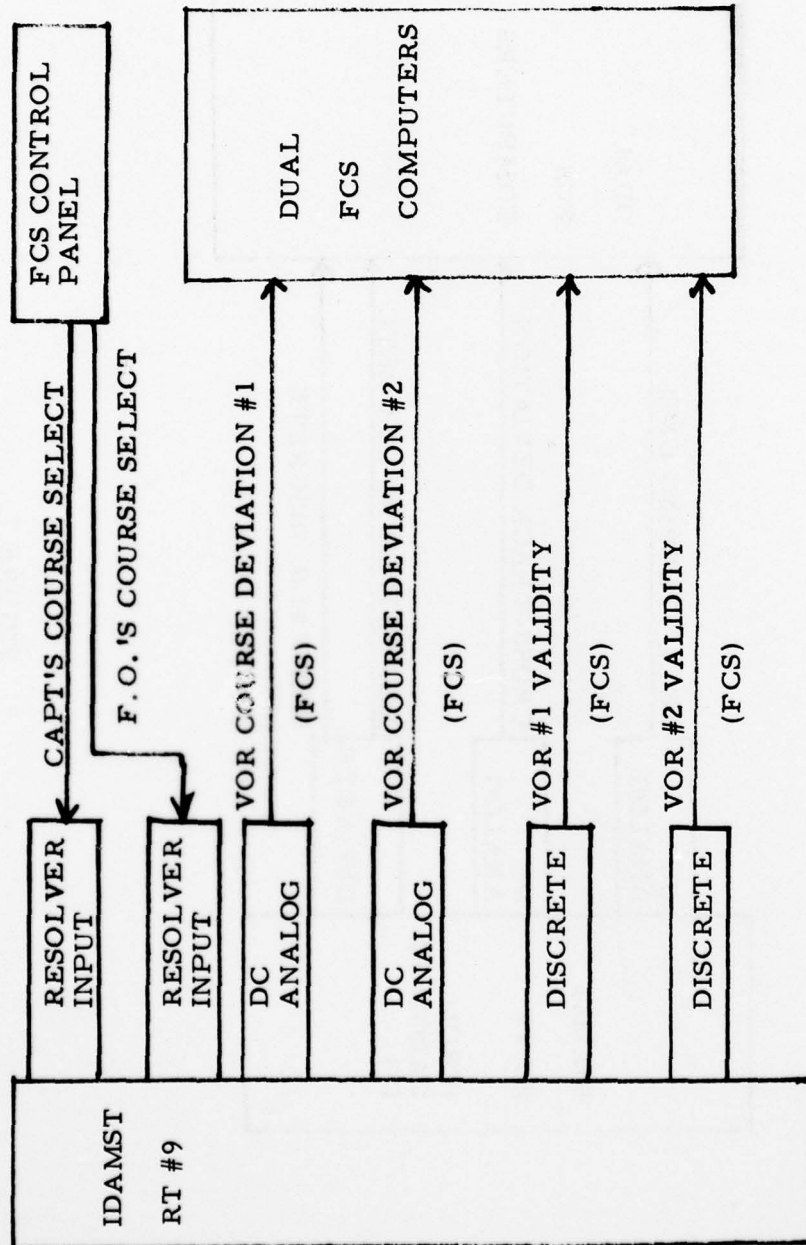
Figure 7 depicts the FCS interface with the IDAMST supplied navigation signals.

The FCS receives roll steering command and cross-track deviation dc analog signals from the CAROUSEL IV Navigation Computer via IDAMST RT Number 9. Each signal will have a separate Analog Interface Module. The Leg Switching and Nav Validity discretes originating from the CAROUSEL IV may both be supplied from a common Discrete IM.

3.1.2.4 Group 1 Interfaces

Group 1 parameters originate in the FCS and are used by the IDAMST electronic displays. The FCS signals originate as dc analog or discrete signals and are transferred to the IDAMST Bus by Remote Terminal Number 9.

VOR INTERFACE



NOTE: VOR TUNING IDENTICAL TO
ILS TUNING. - SEE ILS INTERFACE

FIGURE 6.

NAVIGATION COMPUTER INTERFACE

(CAROUSEL IV)

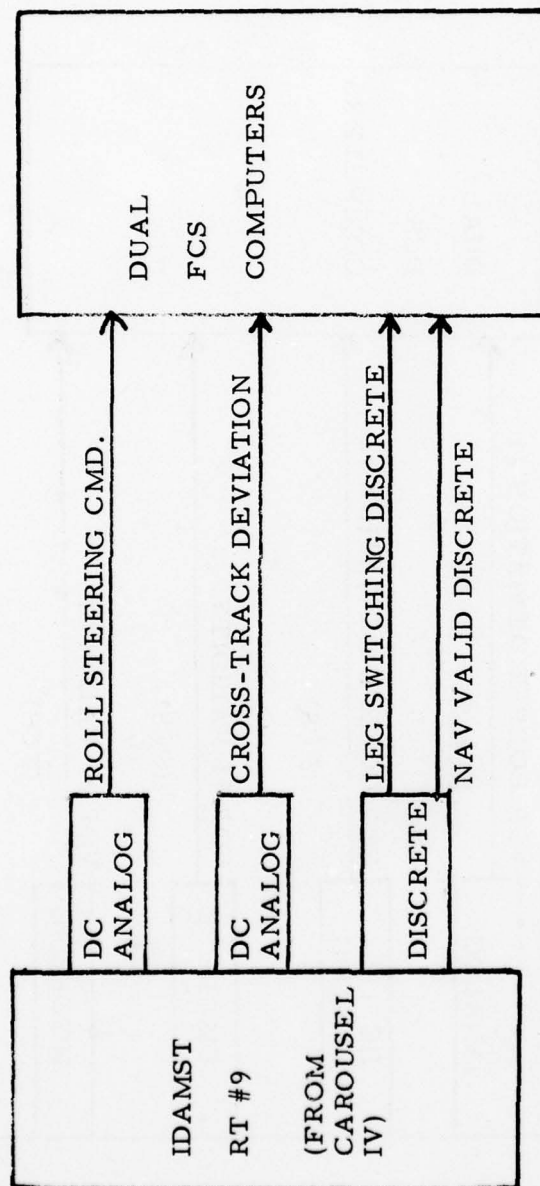


FIGURE 7.

FLIGHT DIRECTOR & HUD INTERFACE

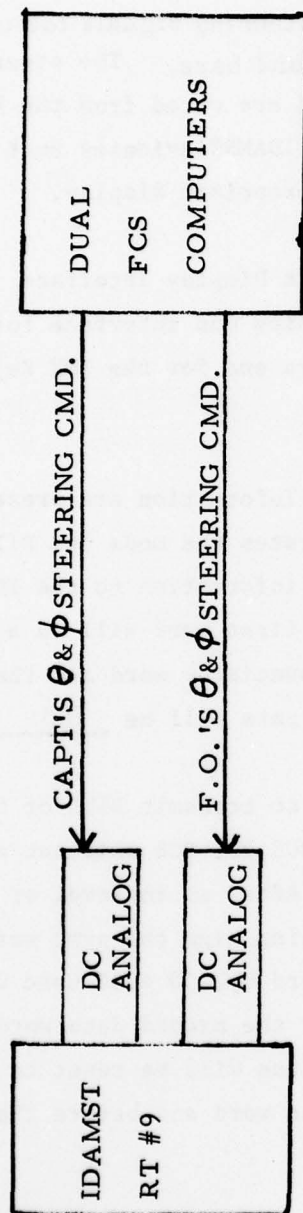


FIGURE 8.

3.1.2.4.1 Flight Director and HUD Interface

The FCS generates pitch and roll steering signals for use by the ADI and HUD Pitch and Roll command bars. The steering commands for both displays are identical and are wired from the FCS to a single d.c. Interface Module. The IDAMST Avionics must route the steering command signals to the appropriate display.

3.1.2.4.2 FCS Mode Annunciator and BITE Display Interface

Figure 9 indicates the IDAMST Avionics bus interface for the FCS Mode Annunciation, the BITE displays and for the IMK Keyboard BITE commands.

The FCS Mode Annunciation and BITE Information are presented on the IDAMST CRT displays. The FCS generates the mode and BITE display information and will transmit this information to the IDAMST system as three 16-bit serial words. The first word will be a sync word followed by the second FCS Mode Annunciator word and the third BITE display word. The serial data bit rate will be TBD MHz.

In operation, when the FCS desires to transmit BITE or Mode Annunciation information to the IDAMST BUS the FCS will set a "DATA COMING" line to a nominal 28 VDC, After an interval of 150 ± 50 micro-seconds following the line going high the sync word will be transmitted. Following the sync word by 150 ± 50 usec will be the first data word followed in turn by the second data word in another 150 ± 50 usec. The "DATA COMING" line will be reset to zero anytime after the beginning of the sync word and before the end of the second data word.

The MSB of either data word set to a "1" will signify the valid display word. In all serial data transmissions all three words will be sent but only one data word will have the MSB set to "1".

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SPECIFICATIONS FOR IDAMST SOFTWARE. VOLUME II. APPENDICES.(U)

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Each data word will be binary encoded with a particular display message. Table 2 gives the data word binary code for each particular display message.

3.1.2.4.3 IMK BITE Commands to FCS Interface

The IMK/FCS interface, as shown in Figure 9, is performed through 5 d.c. discrete voltage lines.

As presently envisioned, the FCS BITE will be initiated either by a specific "EXECUTE FCS BITE" entered from the IMK or by an automatic FCS BITE EXECUTE command generated as a portion of the total IDAMST Self-Test.

In either case, the FCS will have more than one BITE mode. One mode will exercise the entire FCS system including the surface actuators, if safe to do so from a personnel standpoint. Another mode would exercise the FCS system minus the aircraft control surface actuators. There may be additional FCS BITE modes.

The FCS will be commanded to execute its BITE routine by a momentary interrupt discrete. However, before the interrupt line is pulsed the four discrete data lines must be set to indicate to the FCS which BITE mode to execute. After the FCS computer receives the "EXECUTE BITE" interrupt it will read the 4 data lines to determine which routine to perform.

The encoding of the discrete data lines is given in Table 3.

3.2 CHARACTERISTICS

TABLE 2.

SERIAL DATA WORD MESSAGE ENCODING
(FCS Mode Annunciation & BITE Display)

DISPLAY MESSAGE

16-Bit Binary Code

LSB

MSB

FCS BITE MODE DATA LINE ENCODING

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The DAC or A/D associated with the IM shall have a ± 10 VDC signal range and a conversion resolution of 10 magnitude bits plus 1 sign bit (11 bits total). The DAC and A/D conversion time shall be 150 usec maximum. The linearity of the gain amplifier plus digital conversion shall be ± 1 LSB full scale.

- The a.c. analog input IM shall be a d.c. IM with a floating demodulator front end. The a.c. input IM shall be provided on a.c. phase reference voltage from the interfaced signal source equipment. The demodulated signal polarity shall be (+) for a.c. inputs in phase with the reference voltage.

The maximum a.c. signal range shall be 0-13 vrms, 400 Hz. The reference voltage shall be 26 vrms, 400 Hz.

Input impedance shall be $\geq 10K$.

- The a.c. resolver input IM shall accept ARINC-407 resolver signals for development of the $\sin \theta$ and $\cos \theta$ functions by the IDAMST Avionics. The resolver IM shall provide the required 26 vrms, 400 Hz excitation to the interfaced equipment resolver. The IM shall use the resolver excitation voltage as the demodulator phase reference. Voltage phasing and mechanical shaft rotation shall be as specified in ARINC-407.

The IM shall convert the sine and cosine resolver signals with an accuracy sufficient for the IDAMST avionics to differentiate mechanical shaft rotation to within one degree.

3.2.1 Interface Module Requirements

All the FCS signals interfacing with the IDAMST Multiplex bus remote terminals have their signals conditioned by an associated Interface Module. The FCS/IDAMST interface requires the following IM types:

- 1) D.C. Analog Input (to IDAMST System)
- 2) D.C. Analog Output (from IDAMST System)
- 3) D.C. Single Ended Discrete Input
- 4) D.C. Single Ended Discrete Output
- 5) A.C. Analog Input
- 6) A.C. Resolver Input

The Interface Modules, in addition to satisfying the Remote Terminal requirements, must be able to operate with the following signal characteristics:

- Both the single-ended discrete input and output voltages will be:
HIGH 27.5 ± 1.0 VDC
LOW 1.0 ± 1.0 VDC

The source and load impedance will be TTL compatible
with source = 500Ω
load $\leq 100K$

- The DC analog input and output modules shall contain a gain adjusting, isolation amplifier to accept signal ranges from -30 to + 30 VDC. The gain amplifier will scale the entire analog signal range from, or to, a standard ± 10 VDC range for use with a Digital-to-Analog or Analog-to-Digital converter with Output or Input IM's respectively. The gain amplifier shall have an input impedance $\geq 50K$ with an output impedance ≤ 200 ohms.

3.2.2 Parameter Data Rates

The FCS computers will run with a fundamental frame rate of 20 sps. Therefore, the analog dc radio and navigation Group 2 parameters (REF: Figure 1) shall be updated by the IDAMST avionics at a sampling rate of 20 Hz minimum. In the event that the FCS is run as a multi-rate program the Group 2 FCS inputs would probably be sampled at some rate less than 20 Hz. However, IDAMST shall provide these parameters at the required 20 Hz irregardless.

The FCS will provide the IDAMST Group 1 parameters at an update rate equal to the FCS fundamental frame rate of 20 Hz. The HUD and Flight Director parameters will be updated at 20 Hz. The BITE and MODE ANNUNCIATOR serial sync plus data words will be output at 20 Hz. However, IDAMST must interrogate the "DATA COMING" line and the MSB of each data word to determine if the serial data is to be used to update the displays.

BITE & FGS MODE ANNUNCIATOR INTERFACE

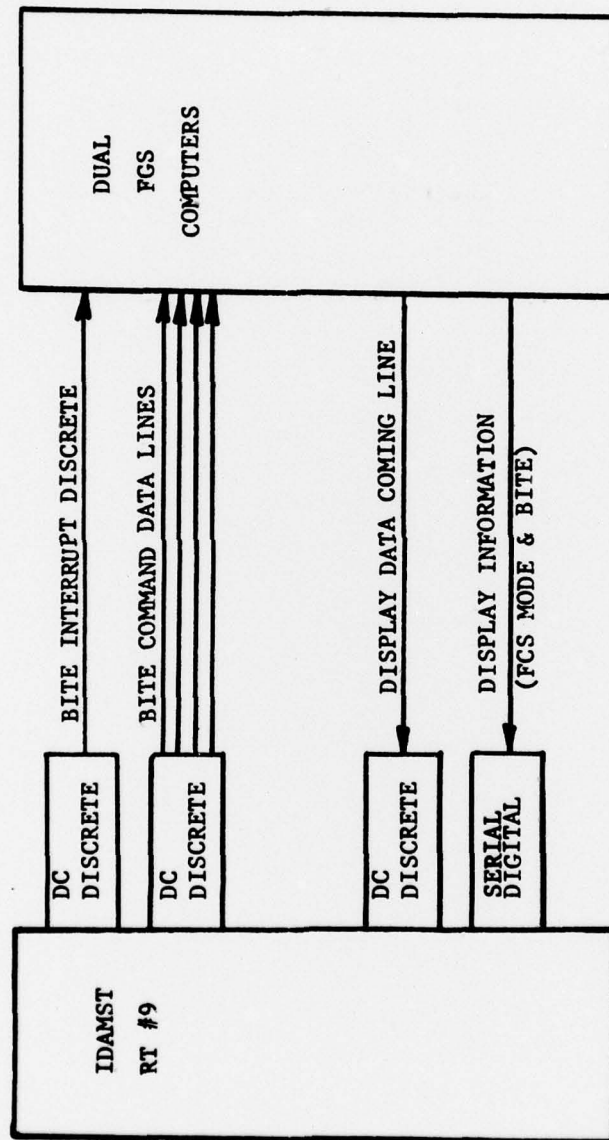


FIGURE 9.